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P-92 PENICILLIN

NEW PENICILLIN SALT WITH DECREASE IN REACTION RATE*

ALFRED B. LONGACRE, M. D.†
NEW ORLEANS

The increasing incidence and severity of reactions developing in patients receiving penicillin argues against the indiscriminate use of this antibiotic. Reports in the literature support the fact that in many instances these reactions will subside following cessation of penicillin therapy. However, in certain cases the reactions, though rarely fatal, are often distressing and may lead to complications interfering with the expected recovery. The instances of fatal reactions[1-4] are relatively few and not always clear-cut, but leave the impression that those reporting those cases felt that penicillin contributed to the anaphylactic type of reaction responsible for the patient's death.

INCIDENCE OF REACTIONS

The literature contains numerous reports pertaining to the incidence[5-11] of penicillin reaction. Pillsbury[12] *et al*, in 1947, pointed out that there is an increasing incidence of reactions to penicillin therapy. They found that in the first 824 patients with syphilis treated with penicillin 1.8 per cent developed a reaction; whereas in the last 200 cases roughly 5 per cent showed some form of an allergic reaction. Cormia,[13] in 1945, reported an incidence of 0.5 per cent of 2000 soldiers showing an allergic reaction to penicillin. In 1948, Black[7] reported an incidence of 2.2 to 5 per cent in patients receiving penicillin; whereas in 1949 Barton[17] reported that 10 per cent of the patients receiving penicillin parenterally demonstrated some form of reaction. From these reports it seems reasonable to conclude that the incidence of reaction in patients receiving parenteral penicillin probably is between 6 and 10 per cent of those receiving the drug. The incidence of contact dermititis seen in patients receiving local penicillin is somewhat higher, being observed in between 10 and 20 per cent of the patients. Reactions following oral administration of penicillin as tablets, inhalation, or lozenges are probably equal to those of the parenteral series.

As a result of the increased incidence and severity of reactions in penicillin therapy two unfortunate situations are developing: (1) Some patients with a relatively mild infection in which penicillin would be of benefit, are being deprived of this drug, in order to guard against sensitizing these patients to penicillin in the event that at some later date they may require penicillin for a more serious infection. (2) Other patients with a relatively severe infection, who should receive the advantages of penicillin, are also being deprived of its advantages because of a history of a previous reaction to penicillin.

P-92

A new penicillin salt known as P-92 has been developed. Preliminary studies have demonstrated that this form of penicillin not only markedly decreases the incidence

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†Assistant Clinical Professor in Surgery, Department of Surgery, Louisiana State University, School of Medicine, New Orleans.

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of reaction, but also decreases severity of reaction in those in whom a reaction has been observed with other salts of penicillin. P-92 is a penicillin salt of N-methyl-1, 2-diphenyl - 2 - hydroxyethylamine. Experimental studies with the base N-methyl-1, 2-hydroxyethylamine have demonstrated that it possesses certain antiallergic properties which are not related to a true antihistaminic action.

P-92 is prepared as a white powder and is distributed as such in vials of 10 mm. capacity. Addition of 4.2 mm. distilled water to the contained powder makes a suspension with each millimeter containing 300,000 units of penicillin. In the powder form P-92 is completely stable, but when once put into a suspension its stability will decrease, but compares favorably with other forms of penicillin. It has a high rating of syringeability being easily administered intramuscularly through a 21 gauge needle; without discomfort at the time or site of injection.

RESULTS WITH USE OF P-92

This report is of the results obtained in a series of patients to whom this new penicillin salt P-92 was administered. These patients came from the Surgical Service of Charity Hospital and the Surgical and Medical Service of Touro Infirmary in New Orleans, as well as from the author's private practice. In this series are many cases which had a history of previous reaction to other dosage forms of penicillin. A careful history pertaining to previous allergy or to whether or not they had received penicillin therapy prior to this admission, and if they had, whether or not they had a reaction to this penicillin was sought after in every case. All laboratory determinations were made in the Antibiotic Research Laboratory, a Department of Surgery of the Louisiana State University School of Medicine*

Prior to initiating the clinical study to determine the incidence of reactions and therapeutic value of P-92 penicillin, several determinations of penicillin blood concentrations following the administration of a single dose of 300,000 units intramuscularly were made.

Table 1 summarizes the blood levels obtained following a single injection of 300,000 units of P-92. Accepted serum blood levels of penicillin were observed in all instances for a twelve hour period following injection. At twenty-four hours 7 of the 12 subjects still possessed the therapeutic blood level. Two of the remaining 5 subjects possessed minimal concentrations of 0 to .015 units of penicillin per cc.; whereas in 3 instances no penicillin was demonstrable in the blood serum. Even though 4 of the subjects demonstrated penicillin blood lev-

*This study was made possible by grant of Commercial Solvents Corporation which also supplied the P-92 penicillin.

TABLE 1
INTRAMUSCULAR PENICILLIN P-92
Code No. 323

Case No.	Control of Pt. Serum	6 hrs.	12 hrs.	24 hrs.	36 hrs	48 hrs.	60 hrs.	72 hrs.	Sensitivity of Test
1	G	.25	.125	.062	.062	.062	.062	.031	.031
2	G	.125	.125	.062	G	G	G	.031	.031
3	G	.25	.125	.031	G	G	G	....	.031
4	G	.25	.125	.125	.062	.031	G	G	.031
5	G	.062	.031	G	G	G	G	G	.031
6	G	.25	.062	....	G	G	G	G	.031
7	G	.25	.062	G	G	G	G	G	.031
8	G	.125	.062	.015	G	....	G	G	.015
9	G	.125	.062	.015	G	G	....	G	.015
10	G	.25	.125	.062	.015	G	G	G	.015
11	G	.25	.125	.125	.031	.031	.015	.015	.015
12	G	.25	.125	.031	G	G	.015	.015	.015

Number — Unit value of penicillin per ml. of patient's serum
G — No inhibition of growth
Methed — Serial dilution
Test organism — C-203 *Streptococcus pyogenes*
Broth — Difco heart infusion broth B-38

els throughout the remaining period of observation, these levels were of such low concentrations and occurred in such a low percentage observed, that for practical purposes P-92 penicillin should not be considered effective longer than twenty-four hours following injection.

Table 2 includes the interval between the last preceding dose. The total dose of P-92 at the time the blood specimen was taken is recorded to correlate with the blood level. Many of the blood levels obtained under these conditions were higher than those seen following the single dose. It is conceivable that there is an additive effect of the penicillin which will account for this increase in level. Tables 3 and 4 contain the blood levels obtained when penicillin P-92

TABLE 2
PENICILLIN IN PEANUT OIL
P-92 300,000 u/ml.

Case No.	Control of Pt. Serum	1 hr	4 hrs.	12 hrs.	24 hrs	48 hrs.	72 hrs.	Sensitivity of Test
1	G	.063	.125	.063	.125	.015	G	.015
2	G	.125	.125	.063	.063	.032	.125	.015
3	G	.032	con-tam.	.063	.063	.032	G	.015
4	G	.063	.125	.125	.125	.063	.125	.015

Number — Unit value of penicillin per ml. of patient's serum
G — No inhibition of growth
— — No specimen
Methed — Serial dilution
Test organism — C-203 *Streptococcus pyogenes*
Broth — Difco heart infusion broth B-38

TABLE 3
P-92 PENICILLIN IN ALUM. MONOSTEARATE
PEANUT OIL
300,000 u/ml.
Jan. 9, 1951

Case No.	Control of Serum	½ hr.	1 hr.	4 hrs.	12 hrs.	24 hrs.	Sensitivity of test
1	G	.063	.063	.063	.063	.063	.016
2	G	.031	.063	1.0	.25	.031	.016
3	G	G	.016	.031	.013	.031	.016
4	G	G	.016	.031	.063	....	.016
5	G	....	.125	.25	.063	.031	.016

Number — Unit value of penicillin per ml. of patient's serum
G — No inhibition of growth
— — No specimen
Test organism — C-203 *Streptococcus pyogenes*
Broth — Difco heart infusion broth B-38

TABLE 4
SPOT BLOOD LEVELS DRAWN ON PATIENTS RECEIVING 300,000 U. DOSES OF P-92
IM. PENICILLIN. LOT NO. 308443

	u/cc serum	Hrs. after last dose	Total P-92 in cc.	u/cc serum	Hrs. after last dose	Total P-92 in cc.
1. Open reduction and fixation of right femur	0.5	3½	15 cc	0.5	3½	14 cc
2. Fracture of head of radius	0.125	6	3 cc	0.125	6½	4 cc
3. 3° burns of left lower extremities	0.125	4½	10 cc	*0.062	2¾	11 cc
4. Carcinoma of face	0.25	4½	10 cc	0.5	3	12 cc
5. Cholocystectomy	0.5	4	9 cc	P-92 discontinued		
6. Hernioplasty	1.0	6½	9 cc	1.0	5	11 cc

*Had been getting 1 cc. b. i. d. but 24 hrs. between last and next to last dose.
Sensitivity of test — 0.015
Method — Serial dilution
Test organism — *Streptococcus pyogenes*
Broth — Difco heart infusion broth B-38

is suspended in two different menstruums, namely, in peanut oil and in peanut oil with a monostearate base. In both instances, the blood levels, though of a lower magnitude than those obtained from the P-92 suspended in saline, did persist for considerably longer periods. Levels obtained when the P-92 was suspended in peanut oil are higher than those when obtained from penicillin suspended in peanut oil and aluminum monostearate. Observations indicate that P-92 suspended in peanut oil will in many instances maintain the therapeutic blood level for at least forty-eight hours, in a fewer instances for seventy-two hours. Traces of penicillin have been observed following a single dose of P-92 in peanut oil for as long as ninety-six hours.

Clinical observations have been made on a total of 312 patients, all of whom received P-92 penicillin parenterally. For the purpose of therapeutic analysis the patients have been divided into three groups, namely, clean cases, contaminated cases, and cases of primary infection. In this series the clean and contaminated cases total 245 patients of which only 205 were complete enough for therapeutic evaluation. In 5 instances an infection developed regardless of the antibacterial therapy, which in addition to P-92 included other antibiotics. There are 45 cases of infection which received P-92 penicillin in addition to other antibacterial therapy. Because of this complexity of treatment any accurate evaluation of any one of the factors of therapy is impossible and any comment as to the possible evaluation of the penicillin factor of the treatment would be pure speculation. The records of the remainder of the cases as well, for other reasons, did not lend these patients to a therapeutic evaluation of their treatment. The results observed in these cases support the conclusion that the therapeutic value of P-92 is at least equal, if not better than other types of penicillin, especially those of the long acting type.

All of the patients in this series received P-92 in 300,000 unit dosages administered twice daily, the total daily dose being 600,000 units. The longest consecutive period of treatment for any one patient was fifty-three days for a total dosage of 16,800,000 units without evidence of reaction. In 175 cases the duration of treatment varied between three and eight days; whereas in another group of 111 patients the duration of treatment varied between eight and twenty-two days. Of the remaining patients only 28 received penicillin for a period of less than three days, the remaining receiving it for a period exceeding twenty-one days.

In this series, 67 patients had received other forms of penicillin prior to this admission. Of the 67 patients 10, or 14.9 per cent gave a positive history of one form or another of reaction to the penicillin. A positive history of allergy other than drug was obtained in 32 of the patients. Of the remaining patients, 178 denied any history of allergy; whereas in the remaining 83 the information was too unreliable to determine either the presence or absence of an allergy.

All patients who developed even a questionable reaction are included as possibly due to P-92 penicillin. There were 9 instances in which the patients developed some type of reaction to the therapy which they were receiving, including P-92 penicillin. In 5 of these 9 instances it is believed that the reaction might be directly attributable to the P-92.

In 1 of these 5 patients there was a positive history of a severe reaction to the previous administration of a procaine crystalline potassium G type of penicillin. This was characterized by an urticarial type of rash over the entire body accompanied by edema of the eyelids, the fingers, and neck, lasting for approximately three weeks and terminating with an extensive desquamation. P-92 penicillin was administered to this patient during a recurrent attack of a single acute infection. Following the second dose of P-92 an urticarial rash developed and there was some edema of the hand. However, the patient stated that the reacton was not as severe as prevously experienced and it subsided within one week. In another instance, a reaction developed in a patient with a positive history of pompholyx. Following the administration of P-92 prophylacticly this patient developed a recurrence of this condition.

The remaining 4 patients who developed a reaction while under observation received in addition to P-92 penicillin other antibacterial medication including antibiotics and the sulfa drugs. Even though the P-92 could possibly be the responsible agent for these reactions, it would be admittedly unfair to attribute it solely to this preparation without considering the possibility that any one or more of the other drugs might as readily have been the cause.

In a case of severe virus infection with a previous history of a severe penicillin reaction, P-92 was administered in desperation in dosages of 600,000 units every four hours. There was immediate improvement in the clinical picture; the temperature returning to normal within eight hours, but followed by a slight elevation to 101° F. for a period of twenty-four hours. On the second day of P-92 therapy there developed a fine maculopapular eruption and a few urticarial wheals over the abdomen and forehead. In this instance, history of sensitivity to previous dosages of phenobarbital was obtained and the present cause of the reaction is confused with the fact that this patient in addition to the P-92 penicillin had received two large doses of phenobarbital during the course of treatment. It is conceivable that the reaction might be attributed to the phenobarbital, for with continued P-92 therapy the reaction subsided. However, inasmuch as P-92 sensitivity cannot be excluded in this case, it is included in the series of 9 patients who developed a reaction during P-92 therapy.

Another patient in whom a reaction developed, and on whom several other drugs in addition to P-92 were used, was given a test dose of P-92 following his discharge from the hospital at which time he still had a rash and urticaria. He returned at daily intervals for check-up and stated that the rash seemed to begin to disappear following the test dose of P-92 penicillin.

The following case will illustrate the advantage of a hypoallergic penicillin for patients who are known or found to be sensitive to penicillin. Twenty-four hours after starting regular crystalline penicillin G treatment for a pelvic infection, this patient developed a severe urticarial rash and edema accompanied by a slight elevation of temperature. P-92 penicillin was immediately substituted and all signs of reaction completely cleared in thirty-six hours and did not return during the entire course of treatment with this latter drug. Unfortunately the supply of P-92 ran out, and because of the persistence of the infection the patient was given a procaine crystalline penicillin G form with immediate recurrence of all of the allergic manifestations. This case suggests that it is possible, in some instances at least, to give P-92 even in the face of a known penicillin sensitivity. It also suggests the possibility that P-92 may be of value becouse of regression of an established penicillin allergic reaction.

Of the patients who gave a positive history of reaction to penicillin administered at some time prior to the treatment under observation, 7 received P-92 penicillin without developing any signs of reaction to the drug. In another instance in which a patient had previously been sensitive to penicillin, the reaction was included in that group in which multiple forms of therapy confused the evaluation of the cause of the reaction. And in another patient the reaction directly attributable to P-92 penicillin was much less severe than the previous reaction which the patient had experienced when given procaine penicillin G.

SUMMARY

Of the 312 patients under observation for reaction, 9 or 2.8 per cent developed some form of reaction. However, this figure of 2.8 per cent incidence of reaction probably does not give the exact incidence of reaction of the patients receiving P-92 penicillin. Likewise a corrected figure obtained by omitting those receiving other therapies which might have been responsible for the reaction, would also be misleading. For purposes of discussion it can be concluded that 2.8 per cent of the people who received P-92 penicillin in this series did show some form of reaction which may or may not have been due to the penicillin. The percentage rate of reaction in those patients in which P-92 was the only antibacterial therapy, and thus probably the only cause, was

1.6 per cent. Regardless of which percentage rate of reaction is the correct one, either of them is considerably below the present reaction rate seen in patients receiving other forms of penicillin.

It appears that P-92 can be safely given to patients who are known to be sensitive to penicillin, or in whom a reaction develops while receiving other penicillins. This is attested to by the fact that of the 10 patients with a history of a reaction to regular penicillin, 7 did not show any reaction when receiving P-92 penicillin. Whereas, in one of the two other instances with a known sensitivity to previous penicillin, the reaction with P-92 penicillin was minimal as compared to a very severe reaction on the other penicillins. In another case the exact cause for a reaction developing during therapy cannot be actually determined, in that the patient received in addition to P-92 other specific antibacterial therapy which could have been responsible for the reaction. A case in this series developed a reaction while under therapy with regular penicillin. This reaction subsided and did not recur while under P-92 penicillin, but did recur when the patient was placed back on regular penicillin once again. Not included in this series, but in a private case of another physician was a similar instance of a patient with a penicillin reaction; the reaction subsided while under therapy with P-92 penicillin.

Though it cannot be concluded that P-92 will not cause reaction, this study indicates that the amine base of P-92 may be of value in causing regression of certain allergic reactions to other forms of penicillin. It also in many instances will prevent a reaction in patients who have reacted to other forms of penicillin and in specific cases where penicillin is mandatory, even in the presence of a marked sensitivity, P-92 can be administered with the hope that the reaction will be minimal. Consequently, this form of hypoallergic penicillin will prove to be a valuable addition to the present antibiotic armament against infection.

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TUBERCULOSIS TREATED WITH ANTIBIOTICS*

CHARLES R. GOWEN, M. D.
E. C. EDWARDS, M. D.
SHREVEPORT

Since Robert Koch, in 1882, isolated the tuberculosis organism and proved that this was the specific cause of the disease tuberculosis, there has been a constant search for a therapeutic agent that would control the germ and the spread of this organism within the human body.

At first, it was tuberculin with disappointing results. The various salts of the metals, gold and silver, and all the other metals that have been used to treat any disease, were used in turn with the same disappointing results. The reason for reporting this is to point out that we have not completely conquered these organisms yet. In 1944 when Wakeman discovered streptomycin, we had our first hope for a specific drug that we could use in the human without doing more harm than bene-

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The Gowen Sanatorium, Inc., Shreveport, La.

fit to the body. Henshaw and Pfuetze reported the first group of cases of tuberculosis treated with streptomycin with good results. Then the Veterans Administration reported an extensive series of cases with wonderful results. However, further use has proved that streptomycin is not a perfect therapeutic agent which rids the body of all tubercle bacilli.

For the purpose of this report we have chosen 500 specific cases which have come under our personal care and which we have divided into two groups. The first group comprises 223 proven cases of tuberculosis that were treated without any specific therapeutic agent at the Gowen Sanatorium from 1942 through 1945. The second group of 300 proven cases of tuberculosis were treated at the same institution from 1946, when streptomycin became available, to the present time. The first group of 223 cases was treated with the routine of sanatorium rest, pneumothorax in the selected cases, phrenic nerve interruptions, and thoracoplasty where indicated, as well as a few cases of pneumoperitoneum. In this group there were 132 males and 91 females. These were approximately 70 per cent far advanced cases, 20 per cent moderately advanced and 10 per cent minimal. Of these 223 patients there were 28 deaths in the sanatorium; 12 were discharged as unimproved; and the remaining 183 were discharged from the hospital as improved or quiescent. A number of psychological and economic factors enter into the discharging of a patient from a tuberculosis hospital. It is, therefore, difficult to keep a patient until he is absolutely classified as cured. Since it is impossible to hasten the rate of formation of scar tissue, the time element involved in the final stage of getting completely well is one factor. The finances necessary to maintain a patient in a sanatorium is a large factor entering into the time of discharging a patient, particularly those living within an easy radius of the institution. Patients living near can be satisfactorily treated outside of the sanatorium at this stage. However, let me emphasize that no patient should leave the care and routine of a sanatorium as long as he has tubercle bacilli in his sputum. Public health, the health and welfare of his family and associates, and particularly, contacts with young children should determine the length of time a patient should remain in the sanatorium.

In the group of 300 patients, there were 129 females and 171 males. Further classification on admission to the sanatorium showed that 275 had tubercle bacilli in the sputum on ordinary concentration and smears. There were 25 on whom we failed to find bacilli, but who showed definite evidence of active tuberculosis from physical findings, x-ray and the results of treatment with antibiotics.

On admission to the sanatorium, the stages of the disease were as follows: far advanced 212, moderately advanced 69, and minimal 19. On discharge, according to the bacilli found in the sputum, 190 were negative on concentration and ordinary smear rather than culture or animal inoculation, 110 had bacilli in the sputum after various antibiotics had been administered and collapse therapy and sanatorium treatment had been used. According to the classification of the National Tuberculosis Association, 48 of these people are apparently well, living a normal life and working a normal day, most of them at their previous occupations. There are 52 apparently arrested. One hundred and seventy-one would be classified as improved active (in the old classification as quiescent) and are living a very restricted life and continuing their pneumothorax or pneumoperitoneum. Eleven are unimproved and 18 have died.

CASE REPORTS

*Case No. 1** T. G., age 2 months; diagnosis, active tuberculosis. Father had active tuberculosis, tuberculin patch test strongly positive. X-ray showed enlarged hilus gland with extension into the upper left parenchyma and some into the middle right lobe. The baby was treated for sixty days with 0.3 ghs. daily of dihydrostreptomycin, diet, supporting medication, and penicillin, to control the acute respiratory infection when indicated. Her condition showed marked improvement im-

*Courtesy of Dr. R. F. Lucas, of the Children's Clinic, Shreveport.

mediately and the present x-ray shows all involved areas are apparently healed.

Case No. 2. A. B. K., age 64, far advanced pulmonary tuberculosis with bilateral cavitation. He was given 1 gm. streptomycin a day for one hundred and twenty days. Pneumoperitoneum was instituted and excellent results were obtained with a rise of both sides of the diaphragm. The patient left the sanatorium after 8 months, in splendid condition, well above his normal weight. Pneumoperitoneum was continued as the patient came back each week for his refills. The patient remained at home a few weeks, and without apparent symptoms, suddenly developed bleeding from the bowels and vomiting. He was a taken to a general hospital and all treatments failed to give relief and he died within forty-eight hours.

Autopsy report: June 21, 1949—Lungs: Tuberculosis; (a) Consolidated lesion in the right lobe which was tuberculous pneumonia. (b) Miliary. (c) Fibrocaseous nodules which were still active histologically. These were the predominant lesions in the upper lobe (where cavities are reported to have been present before streptomycin). They showed evidence of control or healing. However, in the same location were found active miliary lesions. It was assumed that the miliary seeding and pneumonia represented later developments.

Duodenum: Chronic peptic ulcer. However, it did not look like one that would have given rise to intractable hemorrhage. In view of the tremendous amount of tuberculosis of the liver the prothrombin level may have been low. Also, hemorrhage on the basis of thrombocytopenia may be observed in acute miliary tuberculosis.

Case No. 3. S. H. H. was admitted to the sanatorium in October 1950, male, age 101. X-ray showed far advanced pulmonary tuberculosis with acute laryngeal and tracheobronchial disease. He complained of severe pain and had been unable to take anything but liquids for several weeks and that was very painful. Streptomycin was begun and only 0.25 gram was given daily. Due to his age we were rather hesitant to give a full dose of the drug. Within a week the pain disappeared in the throat and he was eating quite normally for one of his age. His cough and expectoration disappeared, but he continued to have bacilli in the sputum. X-ray showed considerable clearing and fibrosis in all areas. Temperature and pulse were within normal limits most of the time. He expired on April 23, 1951.

In cases of intestinal tuberculosis streptomycin had a most beneficial effect in controlling the symptoms and bringing about an apparent healing of the intestinal lesions.

In another case, that of a chronic purulent rhinitis, we were able to recover the bacilli from the nose. After a few days of administering streptomycin, the condition cleared up and apparently the infection disappeared. No bacilli could be found.

METHOD OF ADMINISTRATION AND DOSAGE

All of our patients received streptomycin intramuscularly. Practically all injections were given in the hips, but a few were given in the arm muscles. Injections in the arm muscles were given only to those patients who had well developed muscles. When streptomycin first became available to institutions, we gave streptomycin every three hours around the clock. Due to extensive soreness of the hips, we soon changed to a schedule of every four hours and shortly to every six hours. The patients still complained of sore hips, so in view of the fact that our clinical results appeared as good on six hour methods as on three hour ones, we went to eight hours and then shortly to twelve hour intervals. This has proven very satisfactory and the incidence of sore hips is much less. Part of this is due, of course, to the fact that we are obtaining a purer drug now.

Our streptomycin solutions are prepared so that each cc. contains 250 mgs. We now use almost exclusively, the dihydrostreptomycin. When the drug first became available, the cost was such that it was prohibitive to give more than a gram in twenty-four hours. Fortunately, this has been found to be the optimal dose in pulmonary tuberculosis and is the dose we maintain in the average case today. Our cases have received streptomycin from thirty to one hundred and twenty days. Most patients receive it for ninety days.

In cases which were proven bronchoscopically to have ulceration of the tracheobronchial tree, we have given streptomycin inhalations in doses of 125 mg. four times a day. Five minutes of adrenalin were usually added to get better distribution of the streptomycin. Inhalations are given alone or in combination with intramuscular injections.

DRUG REACTIONS AND MANAGEMENT OF REACTIONS

The most common reaction to the intramuscular injection of streptomycin is sore muscles at the site of injection. This was

especially distressing with the three and four hour treatment periods. We have found that hot packs give the quickest relief for this condition. With the twelve hour treatment period and more refined streptomycin, this condition does not occur too frequently nowadays. In our series, we had two abscesses which required opening. One of these was sterile.

Dizziness was one of the most frequent reactions. However, most patients adjusted themselves promptly without having to discontinue the drug. In a few the drug was discontinued for a few days and then treatment was resumed. We found that elderly patients are most susceptible to dizziness and we usually treat those patients on 0.5 gram of streptomycin daily. We have had no patient who did not entirely recover from dizziness, though a few of them required a few months to do so. We have had no cases of impaired hearing as a result of treatment.

With our first lots of streptomycin, skin rashes were fairly common. These would usually be controlled with antihistamines. Temperature reaction occurred about the same time. These occurred with and without the accompaniment of a skin rash. These could frequently be controlled with antihistamines. In some cases the patient had to be desensitized to streptomycin by reducing the daily dose to 0.1 gram or less and gradually increasing to full dosage. With present lots of streptomycin, these two types of reactions are not common.

There have been a few cases of visual disturbance which have consisted primarily of difficulty in reading. The patients stated that there was blurring at times. This condition promptly cleared when streptomycin was discontinued. There was one case that developed marked adenopathy and eosinophilia. This caused the patient only slight discomfort and cleared promptly after streptomycin was stopped.

In using antibiotics, timing of giving the drug in relation to collapse therapy is an essential factor in getting maximum results. It is also absolutely essential that the diseased tissue be well drained or the antibiotics cannot reach the source of infection. All active pulmonary tuberculosis that has any symptoms of tracheobronchial disease should be inspected carefully and frequently for ulceration and bronchial stenosis and edematous bronchi by bronchoscopic examination. The management and treatment of tracheobronchial diseases is one of the most difficult that faces the phthisiologist.

Up to ten years ago tuberculosis was considered a disease most prevalent in the younger generation. In the 500 cases reported, about one third occurred in patients under 40 years of age and the other two-thirds, or by far the greater number, occurred in persons over 40, the largest number being between 40 and 70 years. In these 500 cases, the youngest patient was 2 months old and the oldest was 101 years old.

CONCLUSION

We can conclude from the experience we have had that streptomycin is a valuable adjunct in the treatment of tuberculosis. Streptomycin should not be considered a cure-all for tuberculosis, and when used, should be used in conjunction with other standard treatment. We find that streptomycin does shorten, somewhat, the course of the disease and gets many patients in shape for some form of collapse therapy. P. A. S. was used in some cases in which it was suspected that the organism was resistant to streptomycin.

INTRAVENOUS ADMINISTRATION OF DILUTE PITOCIN IN OBSTETRICS*

EXPERIENCE IN 173 CASES*

GEORGE T. SCHNEIDER, M. D.†
JAMES H. FERGUSON, M. D.‡
HENRY K. MILLER, M. D.‡
NEW ORLEANS

The intelligent use of continuous intravenous administration of dilute pitocin in a controlled manner has, in our experience,

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From the Departments of Obstetrics and Gynecology, Ochsner Clinic† and Tulane University of Louisiana, School of Medicine, and Charity Hospital in New Orleans.‡

proved to be a valuable adjunctive obstetrical measure, but like any valuable procedure, it can be abused. For this reason and because of the rapid development of its use in the past year by specialists as well as general practitioners primarily to stimulate the onset of labor, a word of caution should be sounded now. We do not believe that it is a safe enough procedure, for example, for a busy obstetrician to telephone an intern or nurse "to start a bottle of pitocin" on his patient, and then arrive later when the patient is well advanced in labor. Just as the numerous accidents following the injudicious use of intramuscular administration of pituitrin after its introduction in 1909 caused it to be strongly condemned by 1920, so will the intravenous use of pitocin, if its use in the practice of obstetrics is not properly controlled.

It appears that the continuous intravenous administration of pitocin is a safer and more physiologic method than frequent intramuscular injections. It has been shown by Hellman and associates[1] that in contrast to intramuscular injections, the same or smaller doses by continuous intravenous administration give better tokodynamometric patterns of uterine activity with far more increase in work gradient of the uterus. In normal labor the lower uterine segment is relatively inactive, and there is a gradient of activity from the fundus downward. When the normal balance is reversed, that is, the lower segment is overactive, a condition known as uterine "dyskinesia," abnormal labor results with cessation of descent of the head and failure of the cervix to dilate. Similarly, Steer and Hertsch[2] demonstrated electrographically, by means of electrode detection of uterine contractions, that true labor begins with activity of the fundal musculature, which then spreads downward when the proper state of muscular excitability exists. This is in contrast to ineffective, false labor or inertia in which irregular, spasmodic and nonspreading contractions occur in all parts of the uterus. An overdose or too rapid administration of pituitrin or pitocin can produce uterine muscle imbalance.

The indications for intravenous administration of dilute pitocin can be classified into four general groups: (1) induction of labor, (2) augmentation of labor, (3) postpartum uterine atony and (4) incomplete abortion. We have employed this method in 116 patients for induction of labor, 37 patients for augmentation of labor and approximately 20 patients in the postpartum period. Our experience with this group of patients, who were seen during the period 1949 to 1951 either on the Tulane Obstetrical Service at Charity Hospital in New Orleans or in the Department of Obstetrics, Ochsner Clinic, will be discussed.

INDUCTION OF LABOR

Indications—The same precautions and obstetrical contraindications apply to induction of labor by intravenous administration of pitocin as by any other method. There should be no significant pelvic contracture or fetal malpresentation, and ideally, the infant should have reached full maturity. However, in patients with severe pre-eclamptic toxemia, the last condition might not always be possible. We have used pitocin in patients with all types of indications for induction, including toxemia, essential hypertension with or without nephritis, abruptio placenta, missed abortion, polyhydramnios, epilepsy, strong and painful Braxton Hicks contractions at term, multiparous patients who were unable to reach the hospital on short notice after labor began, and patients with ruptured membranes in whom labor did not start spontaneously.

Technic—After having used dilutions of pitocin varying from 5 minims to one complete vial (15 minims) in 1000 cc. of glucose in water, we believe that 5 to 10 minims in 1000 cc. is a satisfactory quantity both for effectiveness and for ease of calculating rate of dosage and total pitocin used. The average total amount of pitocin used during induction in our series was 5.5 minims; the smallest amount was 1 minim and the largest 20 minims.

The infusion is always started before the pitocin is added to the flask in order to prevent a rapid uncontrolled amount of pitocin solution from entering the vein during the manipulations required to introduce the in-

fusion. The rate of flow should always be adjusted to about 10 to 12 drops a minute, until the character and speed of development of the contractions have been determined. In our series the average time elapsed between institution of the infusion and onset of contractions was thirty-five minutes, the shortest being one minute and the longest six hours. The rate can be slowly increased over a varied period of time until rates of 40 to 50 drops a minute have been attained. We have arbitrarily adopted a maximum rate of 1 minim an hour. The routine use of a small bore needle,[3] such as a No. 22, helps prevent too rapid inflow of the solution, which is one of the dangers of the procedure.

Possible complications of this procedure are development of tetanic contractions, elevated blood pressure, or rupture of the uterus. The controlled method of induction just described aids in the development of physiologic uterine activity and prevents the occurrence of sudden tetanic contractions in women whose uterine musculature is especially sensitive to pitocin.

This can be illustrated by the case of Mrs. B., a primigravida, with normal blood pressure but severe edema of the lower extremities and moderate Braxton Hicks contractions. Three weeks after the expected date of confinement a continuous pitocin drip at a rate of 10 drops a minute was started. Contractions became frequent and strong in a matter of minutes, and merely increasing the rate of flow from 10 to 15 drops a minute, produced almost tetanic contractions of long duration, with a mild increase in blood pressure and slowing of the fetal heart rate. When the rate was immediately decreased to less than 10 drops a minute, labor reverted to normal. The membranes ruptured spontaneously shortly thereafter, and soon afterward when satisfactory labor was in progress, the pitocin infusion was discontinued after a total of only 100 cc. (1 minim) had been given. Labor progressed to a successful termination.

We were certain that if the usual 1 minim or greater intramuscular dose had been used in a patient with such a sensitivity, the obstetrician would have experienced some anxious moments attempting to control the tetanic contractions. Especially must one be cautious in using pitocin in any form in patients with prolonged rupture of the membranes. The uterine musculature seems to be more sensitive to pitocin in these women and the great safety advantage which the extremely dilute pitocin infusion offers here is of considerable value.

Blood pressure, pulse and fetal heart rate are always checked routinely before a pitocin infusion is begun and frequently thereafter. For the most part, normal blood pressure is not affected by correct administration of pitocin. However, occasionally, temporary elevation of blood pressure, which is not serious, is produced. This has occurred in several cases, of which the following is an example.

Mrs. B., a secundigravida living out of the city, had normal blood pressure and other physical findings. Labor was induced by an intravenous infusion of pitocin containing 10 minims per 1000 cc. Contractions began in thirty minutes and satisfactory labor ensued for a period of four hours. Blood pressure at this time was 180 mm./Hg. systolic and 120 mm./Hg diastolic, the pressure having been normal prior to this. The rate of infusion flow had never exceeded 16 drops a minute. The infusion was immediately discontinued and within one-half hour the blood pressure returned to normal. Unfortunately, the progress of labor ceased also during this time so the infusion was cautiously restarted. Labor was shortly inaugurated again and was completed in four more hours with the blood pressure remaining normal. This patient received a total of 1000 cc. (10 minims).

In our experience with toxemic patients at Charity Hospital in New Orleans, the incidence of elevation in blood pressure above the stabilized elevated level, after induction by pitocin infusion, is greater than in patients with normal blood pressure. An elevation of over 30 mm./Hg. occurred in 11 of 49 women with toxemic pregnancies, or 22.4 per cent, and a 30 mm. reduction in 6

(12.2 per cent). It was found necessary to discontinue the infusion in a few of these patients but often merely reducing the rate of flow was sufficient to control the blood pressure.

A large proportion of the cases of blood pressure elevation in toxemic patients occurred in our early experience when we were using larger amounts of pitocin and faster rates of administration than we now find necessary. Since adoption of the use of a 5 minim solution in these patients with a maximum rate of flow of 1 minim an hour, blood pressure elevation above a previously stabilized level has not occurred, even in severe pre-eclamptic hypertensive women.

In 13 of the 49 toxemic patients, the hourly urinary output was recorded. There was no change in 12 and a decreased output in one.

Unfortunately, in this series there was one case of ruptured uterus.

This was L. A., a Negro woman at term, gravida III, para II. She was admitted to Charity Hospital after spontaneous rupture of the membranes. The blood pressure and temperature were normal and the fetal heart tones were not audible. There were no uterine contractions. Vaginal examination shortly after admission revealed a rigid, scarred cervix with only 1 cm. dilatation. There is a distinct possibility that the cervix may have been torn at the internal os during the examination. When labor did not occur spontaneously, induction was begun by administration of 15 minims of pitocin in 1000 cc. of glucose in water. Irregular contractions began shortly thereafter, although no significant strong or regular contractions occurred, the patient having been under close supervision by a member of the resident staff. After the patient had received approximately 500 cc. of solution, or 7.5 minims of pitocin, over a period of two and one-half hours, lower abdominal pain and some bright red bleeding developed. Immediate sterile vaginal examination revealed that the cervix had not dilated to any significant extent but that a rupture had occurred in the lower uterine segment which extended upward for a distance of 6 or 7 cm. Cesarean section was immediately done with delivery of a macerated stillborn infant; this was followed by total hysterectomy because of the uterine laceration. The patient made an uneventful recovery.

There is some question in our minds whether the pitocin was the cause of the uterine rupture, because of the weak and irregular nature of the contractions stimulated by the infusion and the rigidity and possible scarred condition of the cervix. A normal spontaneous labor might have produced the same results in this particular patient. However, the amount of pitocin and the rate of administration in this case was much greater than we now consider advisable and safe. Moreover, this case should serve as a warning of what can be expected to occur.

Results—We have analyzed 116 consecutive cases of induced labor by means of pitocin infusions; 45 of these were private patients admitted to the Ochsner Clinic and 71 were admitted to the Tulane Obstetrical Service at Charity Hospital in New Orleans. Of the entire series 87 patients had a favorable cervix and 29 an unfavorable cervix. By favorable cervix, often called "ripe," is meant one which is soft and dilatable with significant effacement or dilatation, or both. Successful induction was achieved in 82 or 94.3 per cent of the 87 patients with a favorable cervix. Of the 29 patients with an unfavorable cervix induction was successful in 10 patients or 28 per cent. Of the 19 unsuccessful cases, 7 were successful when the infusion was repeated on the following day.

The average duration of labor following induction was four hours and fifty minutes. The shortest labor was forty minutes and the longest thirty-six hours.

Discussion—Even though artificial rupture of the membranes may be considered to be somewhat more effective than pitocin infusion, the latter has the great advantage of causing no harm if it is unsuccessful. Moreover, it can be repeated with a good chance that the second or even third at-

tempt will be successful. In our series, of the 17 patients who had repeated infusions on successive days induction was successful in 7. Three attempts have been the maximum made to date on any one patient in our series.

Even in the cases of unsuccessful induction with unfavorable cervices, it has been noted that considerable effacement and dilatation of the cervix frequently occur so that labor may start spontaneously within twenty-four to forty-eight hours. Moreover, there is generally produced in these cases sufficient descent of the head and dilatation to enable artificial rupture of the membranes to be done in an urgent case, in which a closed cervix had prevented it beforehand.

AUGMENTATION OF LABOR

Indications—We have experienced a high degree of success with the use of pitocin infusions to augment labor. In these women some sort of labor has already been initiated and what is usually needed is a physiologic stimulus to labor which the continuous dilute intravenous administration of pitocin supplies. The same technic of administration as for induction of labor is used and the same precautions must be observed.

We have found this procedure of value in (1) patients with prolonged labor due, for example, to persistent occiput posterior positions and poor mechanisms of labor, (2) those whose contractions have decreased or stopped because of saddle block, and (3) those in whom the progress of labor has been arrested in the first or second stage because of inertia. We believe that the use of pitocin infusions will lower the incidence of traumatic midforceps deliveries in the latter instance.

Some of the complicated conditions in which we have used pitocin intravenously to augment labor have been abruptio placenta, intrauterine sepsis, breech presentation and one case of eclampsia. In the latter, blood pressure was not affected and the patient was delivered successfully.

Results—Of 37 consecutive patients who received a pitocin infusion for augmentation of labor, 36 or 97.3 per cent had successful results; the only failure occurred in a woman aged 30 years, gravida II, para I, who subsequently required cesarean section for delivery because of cervical dystocia and asynclitism. Her first pregnancy elsewhere had resulted in a difficult breech delivery with a stillborn infant.

The average total amount of pitocin used in 37 patients who had pitocin infusions for augmentation was 3.7 minims. The smallest amount was 1/5 minim and the largest 10 minims.

POSTPARTUM UTERINE ATONY

There are not as many indications for the use of this procedure in the postpartum period as there are for induction or augmentation of labor and we have no controls in this group. We have found it of considerable value in the following conditions in which the postpartum contractile power of the uterus has been diminished and the danger of postpartum hemorrhage is greater: (1) uterine inertia, (2) prolonged labor due to any cause, resulting in uterine exhaustion, (3) the grand multipara, (4) the overdistended uterus from such conditions as polyhydramnios or multiple fetuses, (5) abruptio placenta, and (6) following intrauterine manipulation.

It is our impression in the cases (approximately 20) in which we have employed this procedure that it has helped control and prevent excessive postpartum bleeding. The constant intravenous infusion of pitocin maintains the uterus in a good contractile state for as long as is desired. The infusion can be given at a faster rate since there is no danger of uterine rupture, and 1 cc. or 15 minims of pitocin is used instead of 5 or 10 minims.

INCOMPLETE ABORTION

A field in which the use of dilute pitocin shows promise is in incomplete abortion. Although our experience in this group has been too small to permit definite conclusions, we believe that pitocin infusions may prove helpful in emptying the uterus with a minimum loss of time and blood.

SUMMARY

Our experience indicates that the controlled use of intravenous administration of dilute pitocin is a valuable new obstetrical measure. We have employed this procedure

for induction and augmentation of labor, to prevent postpartum uterine atony and to terminate incomplete or inevitable abortion.

Of 116 consecutive cases in which induction of labor was attempted, success was achieved in 94.3 per cent of the 87 patients with a favorable cervix and in 28 per cent of the 29 patients with an unfavorable cervix. Of the 37 cases in which the procedure was employed to augment labor it was successful in all but one. Our impression from the use of this precedure in the postpartum period in about 20 patients has been that it has helped to prevent postpartum hemorrhage. We also believe that pitocin infusions may prove helpful in treatment of incomplete abortion.

Possible complications of pitocin infusions are development of tetanic contractions with the disturbance of the fetal heart rate, elevation of blood pressure, or rupture of the uterus. However, we believe that these complications can largely be prevented by intelligent use of the procedure.

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MERCURIAL DIURETICS IN TOXEMIA OF PREGNANCY
A PRELIMINARY REPORT*

ROBERT CRAFT SMITH, M. D.
HENRY K. MILLER, M. D.
JAMES W. HENDRICK, M. D.
NEW ORLEANS

It is generally agreed that the prognosis in severe preeclampsia and eclampsia is much better in those patients who maintain, or have induced, a good urinary output. In the management of toxemias of pregnancy, low salt diets, diuretics, and sedation are now almost universally employed. The rationale for this therapy is the current belief that most of the accumulation of edema fluid in these conditions is the result of a disorder in sodium metabolism. Therefore, the diuretic agent that best promotes a sodium diuresis should be the one used in the management of pre-eclampsia. The use of cation exchange resins still has to be evaluated.

The authors have been impressed by the constant, and apparently, safe use of mercurial diuretics in the treatment of congestive heart failure by the medical services. We, therefore, searched the literature for references to the use of mercurials in the prevention and management of pre-eclampsia. Brown and Bradbury,[1] suggested a clinical trial after they observed that salyrgan was the most effective of the drugs studied in promoting the elimination of excess sodium and edema fluid in pregnant women. Salyrgan was compared in their series with other mercurial diuretics, hypertonic glucose, ammonium chloride, aminophylline, and urea.

While mercury has been used as a diuretic agent since the 16th century, the first organic mercury compound was described as a diuretic by Saxl and Heilig in 1920. The drug they used was novasurol, which had been introduced as an antiluetic agent three years previously. Four years later, Brunn introduced salyrgan (mersalyl). Because Brown and Bradbury reported salyrgan as the most effective of the mercurials tested, we have restricted our study to this drug.

The site of action of the organic mercurials in producing sodium and water diuresis is thought to be, largely, if not entirely, in the kidney. The work of Bartram and Christian, in which they injected small amounts of a mercurial in one renal artery, supports this theory. They observed an increase in urine flow, of low specific gravity, on the injected side. When larger amounts of mercurial were injected, the diuresis was bilateral, but after an appreciable delay on the noninjected side. Saxl and Heilig believed there were also extrarenal actions

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From the Department of Obstetrics and Gynecology, Tulane University of Louisiana School of Medicine and Charity Hospital of Louisiana, New Orleans.

of mercury in causing diuresis, but such actions have not been proved.

The mode of action of the mercury in the kidney is thought to be a toxic action on the cells of the renal tubule, which according to Richards, "abolished the power of active re-absorption and power of selective retention of diffusable substances" by the tubules. Ray and Burch[2] have presented a complete review of the pharmacodynamics of the mercurial diuretics.

We have been concerned with the toxic reactions ascribed to mercury and have followed the contraindications to its use, as outlined by Ray and Burch. These include acute glomerulonephritis, renal disease with insufficiency which may interfere with the excretion of mercury and allow accumulation in the tissues, blood urea nitrogen over 60 mgm/100 cc, known idiosyncrasy to mercury, inadequate response to injections, oliguria, hematuria, and albuminuria in patients with previously normal urine, overdehydration, and depletion of electrolytes.

Because there have been no reported fatalities, and only one serious reaction following intramuscular injection of the drug, we have chosen this route in the majority of cases. The medical services employ the slow intravenous injection routinely, but since the only fatalities due to toxic reaction on the heart have been in intravenous therapy, we have been understandably conservative. The generalized edema in severe cardiac patients sometimes necessitates intravenous administration to obtain proper absorption. However, in the toxemias of pregnancy, the heavy edema is usually in the lower extremities, and though subclinical generalized edema may be present, we feel that absorption is adequate when salyrgan is injected in the deltoid or gluteal muscles.

Although authorities differ on the size of dose necessary to induce diuresis, we have used 2 cc. of a 5 per cent solution of salyrgan intramuscularly. Perhaps experience will show us that we can control edema adequately with smaller doses. Since we believe we are not treating a chronic disease, and, therefore, our treatment does not extend over long periods, we have less to fear from cumulative effects of the drug.

Thus far we have confined our use of salyrgan to patients who have been hospitalized for control of toxemia. No ambulatory clinic patients have as yet been treated. We have felt that in this way we can judge our results more accurately. Ultimately, it is planned to use weekly injections in those patients in our toxemia clinics whose control does not necessitate hospital care.

The selection of patients to be treated is made on the basis of sudden, excessive weight gain with pitting edema of the lower extremities. In several instances patients who did not fit these criteria were given salyrgan with poor or no results. Prior to injection with salyrgan, all of the patients treated had been on salt free diets, and many had received hypertonic glucose. Ammonium chloride had also been used frequently, since in many instances the patients had been under ambulatory treatment for their toxemia for several weeks before admission to the hospital. Therefore, this report does not represent a controlled series on the value of salyrgan as a diuretic agent.

Our procedure at the present time is to admit to Charity Hospital all patients with toxemia who do not seem to be controllable in the out patient clinics. This includes a large number who fail to cooperate on salt poor diet. Upon admission, these patients are sent to the toxemia ward, where a complete work-up is done before administration of salyrgan. Intake and output are recorded daily. They are weighed at the same hour each day on the same scales. Salt free diet is prescribed. Sedation is given to patients who are found to need it.

The laboratory work-up includes daily urine albumin determination, electrocardiogram, blood chemistry and kidney function tests. Patients are on a complete bed rest during this time. After this work-up is completed and a base line is reached, the patients are given 2 cc. salyrgan, usually intramuscularly, at 11:00 p. m. Increased urinary output in successful cases is usually

started within the first eight hours, but may be delayed as long as twenty-four hours. In several cases, urine output was appreciably increased after the first hour.

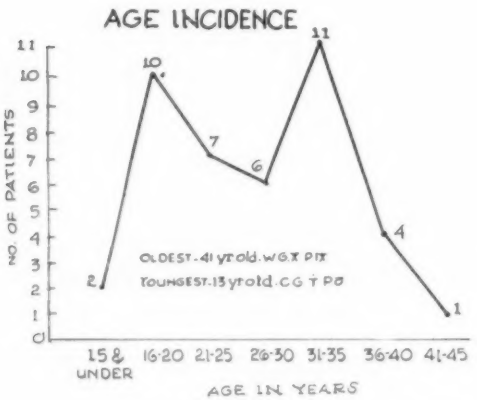
AGE INCIDENCE

The basis for this paper is a preliminary report on the first 41 patients that we have treated. Of these, 33 were colored and 8 were white. As can be seen in Table 1, there was no significant age grouping.

TABLE 1
AGE

	No. of Cases
15 and under	2
16—20	10
21—25	7
26—30	6
31—35	11
36—40	4
41—45	1

Our youngest patient was a thirteen year old colored grav. I, para 0, and our oldest was a forty-one year old white grav. X, para IX. (Fig. 1).



PARITY

As should be expected, nulliparous women made up a large percentage of our cases. Table 2 shows the parity of the patients in our series.

RESULTS

Twenty-nine patients received salyrgan on one or more occasions along with bed rest, salt free diet, and sedation. Twelve patients received, in addition to the above measures, hypertonic glucose and ammonium chloride. The average weight loss in the former group was 7.1 lbs., while 8.3 lbs. was the average loss in those women who received hypertonic glucose as well.

PARITY OF TREATED PATIENTS

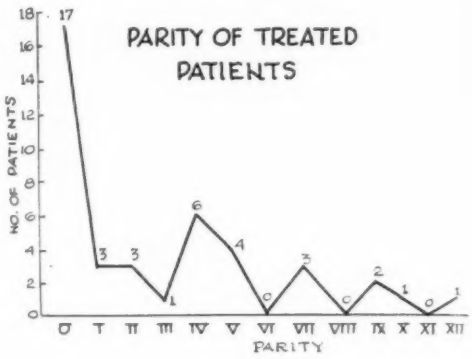


TABLE 2
PARITY

Parity	No. of Cases	
0	17	(41.2%)
I	3	
II	3	
III	1	
IV	6	
V	4	
VI	0	
VII	3	
VIII	0	
IX	2	
X	1	
XI	0	
XII	1	

No effect on blood pressures was noted following the use of the mercurial. Usually, the patients had been treated with complete bed rest and sedation for several days before salyrgan was administered. During this period elevations of blood pressure not due to hypertensive cardiovascular disease are usually well controlled.

In attempting to evaluate our results, we have analyzed the urinary output by comparing the twelve hour period prior to the administration of salyrgan with the subsequent twelve hour period. We have classified our results as follows:

Good	11
Fair	6
Poor	15
Unable to evaluate	9

Among those classified as "poor," we feel that 3 of the patients were definitely "dried out" by the three or four days of salt free diet and bed rest that preceded the injections of mercurial. Six of the patients

in whom our results were poor were improperly selected cases, since they did not satisfy our criteria for selection to the series. These women had chronic hypertensive cardiovascular disease without pitting edema. Five other patients had a decrease in urinary output following the use of salyrgan but showed weight loss for the period of from 2 to 5 pounds. We are unable to explain this except by inaccuracies in measurement of the urine volume.

In all patients in the series, the average urinary output for the twelve hours preceding medication was 2528 cc. The average output for the subsequent twelve hour period was found to be 2723 cc. We feel that this slight increase in average output does not reflect the value of salyrgan, since improperly selected cases as well as those with inaccurate measurement of urine volume are included.

In those patients in whom the results were classified as "fair" and "good," the average output prior to salyrgan was 2116 cc., and after medication 3066 cc., which amounts to almost a 50 per cent increase.

Ray and Burch[2] have listed as toxic manifestations undue apprehension, dyspnea, substernal discomfort, sweating, pallor, and pulse changes. The more serious systemic reactions to mercury may also occur. These include chills, fever, asthma, cutaneous manifestations, and the signs of dehydration and excessive loss of electrolytes. In no instance have we observed any sign of toxicity following the use of salyrgan.

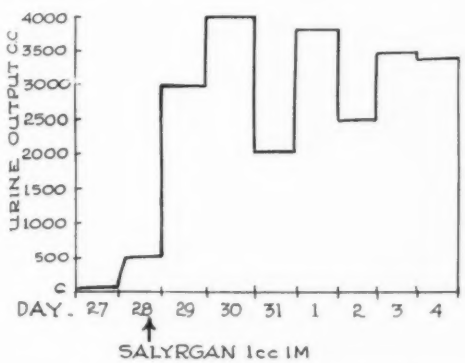
On two occasions we have obtained amniotic fluid, prior to delivery, twenty-four hours following administration of 2 cc. of salyrgan intramuscularly. Neither of these specimens showed any trace of mercury. It is thought to be entirely possible that mercury, which combines with albumin in the body, does not cross the placental barrier. Further studies will be made as to possible effect on the fetus.

In those patients in whom we were able to do follow-up blood chemistries after salyrgan administration, we found no significant alterations. In one severe preeclamptic an elevated blood urea nitrogen returned to normal with salyrgan diuresis. Serum proteins in our cases were not appreciably decreased.

Salyrgan was used with apparently dramatic results in 3 severe pre-eclamptics with very poor urinary output who failed to respond to hypertonic (20 per cent) glucose.

CASE REPORTS

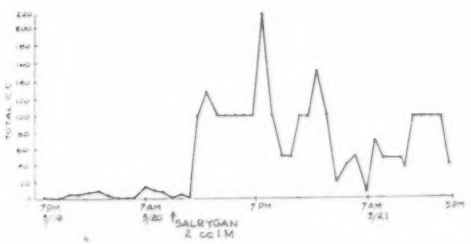
Case No. 1: D. S., a 32 year old grav. IX, para IV, admitted to Charity Hospital on December 27, 1950 with a history of vaginal bleeding, painless at first, of three hours' duration. L. N. M. P. June 18, 1950. E. D. C. March 25, 1951. She had been seen twice during December in the prenatal clinic. Blood pressure was 120/88 on the initial visit, and 132/82 on the second visit. Urine albumin was recorded as negative. On admission blood pressure was 90/60. Urine showed 4 plus albumin. B. U. N. 19.1. The patient was in mild shock. A diagnosis of abruptio placentae was made. Fetal heart tones were not heard. A Porro cesarean section was done and stillborn twins were delivered. Urinary output on the day of surgery was recorded as 27 cc. She received blood transfusions and fluids to the extent of 3750 cc. on that day. On the following day her output was 260 cc. and the blood pressure was 114/90. On the second postoperative day she was given 1 cc. salyrgan intramuscularly. In the following twenty-four hours her urinary output was 3015 cc. She continued to have satisfactory output. On the third postoperative day her blood urea nitrogen was 44.4 mg./100 cc. On January 4, 1951, the blood urea nitrogen was 17.8. Figure 3 shows the daily output following one injection of salyrgan.



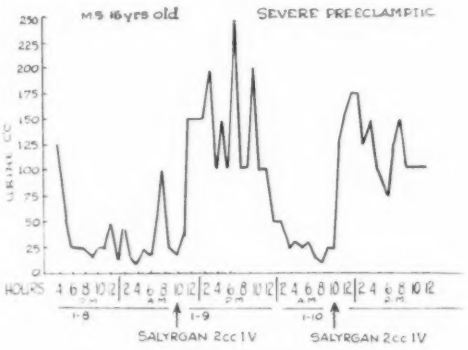
Case No. 2: A. L., a 20 year old colored grav I, para 0, admitted to Charity Hospital on March 19, 1951. L. M. P. August 15, 1950. E. D. C. May 22. She had been followed in the prenatal clinic, having first been seen on November 30, 1950. Blood pressure at that time was 102/66. Her prenatal course was uneventful. She gained 10 pounds between November 30 and March 15. Half of this weight

gain was from February 22 to March 15. On March 17, 1951, she had a severe headache and noticed marked swelling of the feet. She was admitted to the hospital. Blood pressure on admission was 160/90. Urine showed 4 plus albumin, and there was 2 plus pitting edema of the lower extremities as well as edema of the face and hands. She was not weighed on admission. Opthalmoscopic examination showed marked spasm of the retinal arterioles. Sterile vaginal examination revealed a long closed cervix. Fetal heart tones were heard. She was placed on toxemia routine and given morphine gr. 1/6. Intravenous administration of 1000 cc. of 20 per cent glucose in distilled water gave only 45 cc. of urinary output in twelve hours. Additional sedation with morphine and sodium luminal was given. Sixteen hours after admission her total urinary output was 45 cc., and it was decided to give her 2 cc. salyrgan intramuscularly. There was no output in the first hour folloying injection. The next hour the output increased to 100 cc. The twelve hour output following salyrgan was 744 cc. Output remained adequate. Labor ensued and on March 23, 1951, a stillborn infant was delivered spontaneously. Fetal heart tones were last heard March 20, 1951.

Figure 4 shows hourly output preceding and following injection of 2 cc. of salyrgan.



Case No. 3: M. S., a 16 year old colored grav. I, para 0, admitted to Charity Hospital on January 8, 1951. L. N. M. P., June 5, 1950. E. D. C. March 12, 1951. The patient was first seen in our clinic on November 16, 1950, at which time she was five and a half months pregnant. Blood pressure at this time was 130/74. Prenatal course was negative except for excessive weight gain. From her first visit until admission to Charity Hospital she had gained 24½ pounds. On January 8, 1951 the patient was seen in the prenatal clinic and found to have a blood pressure of 190/120. She showed 2 plus edema of the lower extremities. She was admitted to the toxemia ward and given heavy sedation with morphine and sodium luminal. An infusion of 20 per cent dextrose in distilled water failed to increase her low urinary output. On the day following admission to the hospital, 2 cc. of salyrgan was given intramuscularly. The urinary output in the twelve hours preceding this injection was 413 cc. In the twelve hours following mecurial administration the urinary output was 1695 cc. The hourly output then dropped and a second dose of 2 cc. of salyrgan was given. The output for twelve hours prior to the second dose was 408 cc. and 1230 cc. in the subsequent twelve hour period. Figure 5 shows hourly urinary output.



CONCLUSION

The preliminary report on the treatment of toxemia of pregnancy with an organic mercurial diuretic that we have presented does not permit us to draw any definite conclusions. We feel that our results indicate the value of further study. Lack of toxic reactions leads us to believe that mercurials are safe to use in mobilizing edema fluids in pregnant women, if the contraindications to their use are borne in mind. Further, we believe that salyrgan and similar drugs will prove to be a valuable adjunct to therapy in many of our cases of pre-eclampsia, in which there is sudden weight gain with pitting edema. Failure to find any trace of mercury in the amniotic fluid seems to indicate that there is no harmful effect on the fetus.

SUMMARY

1. Forty-one cases of toxemia of pregnancy were treated with one or more doses of salyrgan.

2. No toxic reactions occurred.

3. On two occasions amniotic fluid obtained twenty-four hours following administration of salyrgan failed to show any trace of mercury.

4. Salyrgan increased urinary output by 50 per cent in those women in whom our results were classified as "good" or "fair."

5. Average weight loss in patients treated with salyrgan, salt free diet, and bed rest was 7.1 lbs. Those receiving in ad-

dition, hypertonic glucose lost an average of 8.3 lbs.

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FREE FEEDING IN OBSTETRICS*

M. M. MILLER, M. D.
LAKE CHARLES

Free feeding in obstetrics is not new. It has been used since there have been mothers and children. It has been only during the last thirty years that any other type of feeding, except free feeding, has been used for obstetrical patients. Not until the early 1920's when dietary supplements, such as vitamins, calcium, and iron were given to maternity patients was any thought given to the diet and nutrition of obstetrical patients. In the last twenty years further work has been done in controlling the diet as far as quantity or caloric intake, and quality or an adequate intake of protein, fats, carbohydrates, vitamins, and essential minerals, in order to see that maternity patients had what could be called an adequate and well balanced diet. This trend in supplementary and controlled nutrition has been promoted in an effort to decrease the fetal and maternal mortality rates, as well as reduce complications of pregnancy and improve ethe general health of the obstetrical patient.

Statistics today show that in the last twenty years infant and maternal mortality rates have been markedly reduced. Those who believe in controlled and supplementary diets believe that improved nutrition has been a factor in these improvements. On the other hand at the present time there are a few who are again saying that controlled and supplementary diets are of little value. These would have us believe that little is gained by advising and educating the maternity patient as to her nutritional needs and requirements, or impressing on the patient the necessity for following the dietary instructions. This would revert back to the days in which women received practically no prenatal care.

GENERAL TYPES OF FEEDING

Free feeding in obstetrics must first be defined. True free feeding would be that in which neither the quantity nor the quality of the food that the patient received is controlled, restricted or supplemented in any way, allowing the patient complete freedom as to her diet. She may take as many or as few calories as she wishes. She may eat as much or as little of any class or type of food as she wishes. Diametrically opposed to true free feeding is controlled feeding, in which the patient is instructed as to how many calories she should eat, and the types or classes of food that she should eat. In addition to this, dietary supplements such as vitamins and minerals are usually added. Between these two extremes one finds a combination of free and controlled feeding. One of these might be called free quantitative feeding with controlled qualitative feeding. In this case the patient would be allowed to take as many or as few calories as she wished but would be advised as to what foods to take and supplements such as vitamins and minerals would be added.

The other type of feeding would be classified as controlled quantitative feeding and free qualitative feeding. In this case the patient is restricted only in caloric intake and the quality of her food is not controlled in any way and no vitamins or minerals are added. Both of these types of feeding are a combination of the two extremes of free and controlled feeding.

VALUE OF CONTROL OR FREEDOM OF DIET

In reviewing the literature there are no references to true free feeding. No one has advocated complete freedom of diet, both quantitative or qualitative without restrictions or supplements. This indicates that there is definitely no trend toward complete free feeding at this time. All of the literature on nutrition in pregnancy in the last twenty years indicates that there is some

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control, restrictions or supplements in regard to the diet. The question then arises: To what degree is control or freedom of diet of value? In recent literature most of the trend is toward completely controlled nutrition, although it is becoming more obvious that the qualitative control is much more important than the quantitative control.

King's[1] studies on free feeding in obstetrics have received a great deal of publicity among the profession and also among the lay press. His series of patients consisted of 226 consecutive, unselected, private patients. No restrictions were placed on the diet of these women other than a reduction of salt intake whenever edema was noted in the latter months. Each patient received a multivitamin capsule daily throughout pregnancy and had calcium after the twenty-fourth week. Whenever the hemoglobin fell below 12.5 grams, ferrous sulfate was prescribed. From the point of view of caloric intake the technique was described as free feeding. The women were all of high and moderate income groups and the diets were described as being adequate. At the present time he is evaluating the diets of these patients to see if they fulfill the qualitative requirements of an adequate diet during pregnancy. Of course, the restriction of salt and the addition of vitamins, calcium and iron, remove this series from what might be called true free feeding.

Although the average weight gain was 24.4 lbs. the gain varied from a minimum of 4 lbs. to a maximum of 52 lbs. Forty-eight patients or 21 per cent of the total gained over 32 lbs. during the prenatal period. Thirty-two patients or 14 per cent gained less than 16 lbs. The average amount of weight retained three months postpartal was 2 lbs. but this varied from a loss of 16 lbs. to a gain of 48 lbs. Thirty-two patients, or 14 per cent of the total weighed 8 lbs. more when they were three months postpartal than at the time their pregnancy began. Sixteen patients, or 7 per cent had a net loss in their weight of more than 8 lbs. postpartal.

King's[1] studies in free feeding point out that pregnancy tends to correct over and underweight conditions. It was found that heavy women gain less and retain less weight than slim women who tend to gain more and retain weight. This confirms the findings of Beilly and Kurland[2] who found that obese women gain less weight during pregnancy but usually have larger babies. Dawson and Borg[3] also found that women of excessive body weight in the beginning of pregnancy did not gain in proportion to their weight.

An excessive weight gain was found, by King to be due to either or both of two conditions: an exaggeration of the positive water balance, or developing obesity. Excessive weight gain due to water retention may be a symptom of early toxemia of pregnancy and will disappear almost completely during the postpartal period. Restriction of calories will have little effect on this weight increase and may do harm, if necessary protein is withheld in proportion to the storage of water in an effort to keep the weight down. He also concluded that developing obesity is a psychological problem which is not easily controlled merely by restricting calories. The treatment of obesity requires psychotherapy consisting of giving the patient confidence in the physician and herself, and allaying her fears and anxieties.

A review of the literature shows almost complete agreement with the statement of King[1] regarding an accumulation of fluid and fat. Willson[4] has found that excessive weight, due to a deposition of fat usually gives a relative steady increase in weight; whereas, weight increase due to fluid is usually sudden and unpredictable. Dawson and Borg[3] point out that excessive weight gain does not necessarily mean toxemia but may be just obesity, which is not necessarily harmful. Almost all patients with toxemia gain excessively, but this is usually due to the excess accumulation of tissue fluids. Luikhart[5] confirms the opinion of King[1] that restrictions of salt, ammonium chloride, and moderate restriction of fluid is the best treatment for excessive weight gain due to water retention. It has also

been confirmed by Coopersmith[6] that caloric restriction, appetite depressing drugs,[7] and psychotherapy are more important in the management of excessive weight due to fat deposits.

The effects of excessive weight gain on the maternity patients are variable. It may be true, as has been shown by King,[1] and Dawson and Borg[3] that obesity is not necessarily harmful, although Burke,[8] Wilson,[9] and others believe that a large weight gain will produce a large baby. Sheldon[10] has shown that more stillbirths, neonatal deaths and large babies, occur in women who gain excessively during pregnancy. Whether or not excessive weight, due to fluid retention, is a cause or effect of toxemia of pregnancy, has not been decided.[11-14] Luikhart[15] believes that toxemia and weight increase are definitely related, as in his series of 1,000 patients, with weight controlled to within 15 to 18 lbs., there were no patients who developed toxemia. Loughran[16] states that control of weight, diet, and fluid balance will lead to reduced toxemia, eclampsia, and a shorter labor.

Burke[17] believes that qualitative control is more important than quantitative control. She has shown that women on excellent and good diets have children in good and excellent condition at delivery. The women on poor diets had children in poor physical condition.[18] In fact, almost all premature, neonatal deaths, stillborns, and infants with congenital malformations were from the mothers who had poor diets.[19] Also the infants of the mothers on good diets were larger and longer than those on poor diets. She also believes that protein deficiency is associated with toxemia. In her series of patients only 42 per cent with poor diets had a normal pregnancy. There was no toxemia in the patients who had a good diet, but 44 per cent of the patients, who had poor diets, developed toxemia. Protein in the diet is thought to have a definite relationship to infant vitality and the incidence of toxemia, edema, and anemia.[20] Protein is the most important part of the diet.[21,22] A high protein diet is essential to the welfare of mother and infant.[23,24] One of the big differences between excellent and poor diets is the amount of protein.[24-29]

Tompkins[30] believes in qualitative and quantitative control. In his late writings he carefully restricts the weight gain to 24 lbs. and has established a normal weight curve for the entire pregnancy. This consists of about 3 lbs. the first trimester; 11 lbs. the second trimester; and 10 lbs. the last trimester. This confirms the 24 lb. weight gain as recommended by Chesley[31] and closely resembles his normal weight curve. According to the literature, 24 lbs. is considered to be the optimum weight gain for most maternity patients, who are on a controlled diet. Strangely enough, this is the average weight gain of the patients of King[1] who were on a free feeding regime.

Tompkins[30] has also shown that patients who enter pregnancy overweight and/or gain excessively are more likely to have maternal complications, such as toxemia, pre-eclampsia, and eclampsia, rather than those who enter pregnancy with a normal weight and maintain a normal weight curve. Underweight patients who gain less than normal are also very likely to have complications pertaining to the infant. This results in a much higher incidence of premature infants, neonatal deaths and stillbirths. This theory that inadequate caloric intake and weight gain is injurious is rather new. Patients underweight at the beginning of pregnancy develop toxemia more often than patients overweight at the beginning of pregnancy although the incidence of toxemia is increased in both. The patient who enters pregnancy with an average normal weight but whose weight deviates from the normal weight curve, either up or down, can expect an increase of maternal and infant complications. The patient who enters pregnancy underweight has the greatest risk of developing toxemia or going into premature labor. Less weight gain than normal during the first and second trimester increased the incidence of premature labor. Excessive weight gain in the second and third trimester increased the incidence of toxemia and pre-eclampsia. The incidence of premature labor was 41 per cent less in patients on controlled dietary regimes. The incidence of toxemia

was ten times greater in the patients whose diet was not controlled and restricted. The infant mortality rate was 26 per cent greater, the stillbirths 38 per cent greater, neonatal deaths 15 per cent greater, and premature labor 70 per cent greater, in the patients whose diet was not controlled.[32]

Reviewing the literature leaves one with the impression that obese women have larger infants than small women. Also women who gain excessively have larger infants than those who gain normally, or slightly less than normal.[33] Weight restrictions below the normal weight gain does not reduce the size of the infant appreciably, unless, the nutrition of the mother is definitely inadequate. This leaves the impression that excessive weight gain will increase the size of the infant, but moderate weight restriction will not reduce the size of the infant below normal. The quality of the diet,[34] particularly, as far as protein intake is concerned, is thought to influence the weight, length, and physical condition of the child.[35] It is thought that both the caloric intake and the quality of the diet influences the incidence of toxemia of pregnancy, although there are a few who disagree.[36,37] Maternal and infant complications have been found to have a distinct relationship to the nutritional status of the mother.[38] It has been shown that dietary deficiencies in animals are related to malformations of the newborn.[39-42] This probably applies to humans as well.[43]

REQUIREMENTS FOR ADEQUATE DIET

In view of the fact that obesity and nutritional deficiencies occur very frequently in obstetrical patients, some measure should be made to remedy this. Obesity is known to be detrimental to health as well as are other nutritional deficiencies, which cause such things as anemia[44] and nutritional edema.[45] It has been shown by Burke that only about 40 per cent of women have an adequate diet. An adequate diet during pregnancy as recommended by the Food and Nutrition Board of the National Research Council consists of:

Calories	2600 to 2800
Protein	85 to 100 grams
Calcium	1.5 grams
Phosphorus	2.0 grams
Iron	20 mgms.
Vitamin A	8,000 I. U.
Thiamine	2.0 mgms.
Riboflavin	2.5 mgms.
Niacin	18 mgms.
Ascorbic Acid	100 mgms.
Vitamin D	400-800 U.

It is apparent that the only way many women will have this diet is with the advice and help of the attending physician. This means dietary control, not free feeding.

CONCLUSIONS

In conclusion, no evidence can be found that free feeding in obstetrics contributes to the health of the mother and infant. There is a vast amount of evidence that indicates controlled feeding does contribute to the health of both the mother and infant. The trend is for both qualitative and quantitative control, but the emphasis is shifting from quantitative control to qualitative control, although both are important. At the present time there seems to be little reason to return to the nutritional status of the past, that is, free feeding in obstetrics.

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DISCUSSION

Dr. Jack R. Jones (Baton Rouge): Dr. Miller presents a nice review of the literature on this subject.

An adequate controlled diet for the prenatal patient is essential. Many of the complications of pregnancy can be eliminated by an optimal weight gain. Dawson and Borg state that excessive weight gain due to obesity or deposition of fat is not necessarily harmful. It may not be harmful, but I cannot agree that obesity is conducive to good health, either in the pregnant or nonpregnant state.

There is a variance of opinion as to what constitutes a normal weight gain during pregnancy. Some specify 18 lbs. maximum weight gain and others 25 lbs. For several years I have allowed my prenatal patients to gain a maximum of 18 lbs. from an average weight derived from a chart of standard weights for age and height. In this manner, the underweight patient can gain more during her pregnancy than the overweight patient.

An 18 lb. weight gain from the average weight during the nonpregnant state seems to be enough. A patient loses at delivery from 12 to 15 lbs. and, following the above formula, she may expect in six weeks to return to her desired weight. Approximately 1000 prenatal patients have been on this regime without a single case of toxemia.

Recently, some pediatricians have fostered the so-called demand or selective feeding for children. They believe that the child should be allowed to eat when and of what he wishes and that his physiological and psychological demands will guide him to imbibe the correct quantity and quality of food. Suffice to say, some obstetricians are as liberal with their prenatal patients. Surely they must regret this laxity when complications of excessive weight gain make their appearance.

Most of us agree that free feeding in obstetrics, per se, has no place in present day prenatal care.

ACCIDENTAL HEMORRHAGE IN THE THIRD TRIMESTER OF PREGNANCY*

MELVIN A. SCHUDMAK, M. D.†
BATON ROUGE

Hemorrhage remains the leading cause for maternal mortality, notwithstanding the greater availability of blood and blood substitutes.

Accidental hemorrhage in the third trimester of pregnancy results from a variety of conditions among which are: (1) ulceration of the cervix or vagina; (2) ruptured varicosity; (3) cervical effacement; (4) cervical polyps; (5) premature separation of a normally implanted placenta or abruptio placenta as suggested by DeLee.[1] The first four causes of bleeding are important but not usually a great hazard to the life of the patient. Placenta previa has been omitted from the discussion because hemorrhage from this cause is considered inevitable and not accidental.

INCIDENCE OF ABRUPTIO PLACENTA

As a killer, abruptio placenta ranks second only to placenta previa. The incidence varies with different authors,[1-3] but a fair figure seems to be about once in 130 pregnancies. The condition occurs about three times as often in multipara as in primagravida. This fact is understandable because of the frequent association of the disease with hypertension which, in turn, is so often associated with the older age groups.

ETIOLOGICAL FACTORS

The etiological factors are: toxemia of pregnancy, particularly cardiovascular renal disease. More than one third of all cases of abruptio placenta occur in patients who have cardiovascular renal disease.[1] Without treatment the hypertensive gravida with albuminuria is very likely to develop abruptio placenta or fetal death in utero. Disease of the endometrium is thought to play a role in premature separations, but studies to date yield very little information. With the above conditions present, minor trauma may cause a separation of the placenta, i.e., a sudden jar, coitus, a blow in the abdomen. During labor, operative intervention, version and extraction, separation following delivery of first twin, the use of bags, gauze, or traction on a short umbilical cord may all cause premature separation.

ACCOMPANYING SIGNS

Separation of the placenta is almost always accompanied by marked hemorrhage. The blood escaping under the decidua basalis may go in several directions:

1. The edges of the placenta remaining attached with a lake of blood bulging into the cavity of the uterus and pushing the uterine wall out into the abdomen.
2. May separate the entire ovum from the uterus.
3. Blood may break into the amniotic cavity.

All of the above produce concealed hemorrhage and tend to be most serious. Fatal hemorrhage has occurred without the escape of a single drop of blood from the vagina.

4. Blood may seek passage under the membranes and then out through the cervix and vagina. Regardless of severity, all grades of abruptio placenta begin as concealed types. When the blood dissects up the membranes and escapes to the outside, it is less likely to disrupt further placental continuity and is usually associated with the milder types of premature separation.

Couvelaire described a special serious type of abruptio placenta which he called apoplexia-utero-placentaire. It has become known as a Couvelaire uterus. The uterine muscle becomes infiltrated with blood, petechiae appear under the peritoneum, covering the uterus and broad ligaments, and in the cul-de-sac. The maximum bleeding appears in the uterine wall opposite the placenta, but the greatest muscle dissociation is in the middle and outer muscle layers of the uterus and not in the inner layer as one would anticipate. The frequent uterine atony found in the third stage of labor in abruptio placenta is probably a result of this infiltration of blood to varying degrees.

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†Baton Rouge Clinic, Baton Rouge, Louisiana.

SYMPTOMS

At times very slight placental separation will initiate violent uterine contractions which terminate labor before further separation can take place. Small separations may be manifest by increased uterine irritability with small infarcts present on the placenta at delivery. In certain cases the initial separation is great enough to cause immediate fetal death which may be followed by the loss of the mother. The severity of symptoms depends on the blood loss and degree of shock present. As previously mentioned, the amount of vaginal bleeding does not govern the ultimate seriousness of the disease, and the observer should not be lulled into a false sense of security by minimal visible bleeding.

Sudden sharp abdominal pain, often with a sensation of something tearing, accompanied by marked increased tonicity of the uterus, with or without vaginal bleeding, are the most common symptoms. Increase in the size of the uterus, marked abdominal tenderness to palpation, and changes in the fetal heart tones from normal are signs which may or may not be present. Thirst, rapid pulse, falling blood pressure, loss of consciousness, sweating and pallor, all signs of shock depend on the severity of shock. Remember a blood pressure of 110 or even 150 systolic may represent severe shock in a patient who had had a blood pressure of 200 or more prior to the separation. During the acute episode, the hemoglobin determination helps little since hemodilution temporarily gives false readings.

During labor mild cases of abruptio placenta are frequently seen. The separation usually stimulates contractions, which, in effect, hasten the termination of labor. These infants frequently show some signs of distress—increased agitation and/or increased heart rate. With conditions right, a quick delivery may save some of these babies. The severe cases occurring during labor carry a very poor prognosis for the infant and the mother. The third stage of labor is fraught with danger in abruptio placenta. Many uteri are atonic as a result of overdistention, myometrial disease, or myometrial infiltration with blood. Postpartum hemorrhage occurs frequently, and preparations for treatment should be made in advance. If it occurs, the atony should be treated promptly and vigorously.

DIAGNOSIS

The diagnosis is based on signs and symptoms plus findings on sterile vaginal examination. Severe abdominal pain, increased uterine tone, vaginal bleeding, alterations of fetal heart tones, and shock would point to this condition. The final diagnosis is made after sterile vaginal examination has eliminated other causes of vaginal bleeding. In addition, the vaginal findings influence, to a great extent, the type of treatment to carry out.

TREATMENT

Varied treatment is recommended by groups in different parts of the country, some preferring to deliver almost all of these women by cesarean section,[7] others preferring to deliver almost all from below.[6] A third group tends to combine the two methods[4,5] The author feels that delivery from below is desirable, and almost all of the mild cases should be delivered that way. Some of the severe cases can be delivered from below. Those that occur in multipara in active labor or in multipara not in labor but with a ripe cervix can be delivered from below. Moderately severe cases in primipara in labor with partially dilated cervices and some severe cases well advanced in labor can be delivered from below. Those cases with unripe cervices and those failing to make progress within a few hours should be treated by surgery.

Treatment should be determined by the severity of the case and the condition of the cervix. Attempts to treat abruptio placenta should not be carried out without generous amounts of blood being available. This means, of course, a blood bank or sufficient compatible donors close by. If blood is not available, these patients should be moved to a point of availability. The aim in treatment is to stop the bleeding and replace blood loss. The uterus should be emptied as soon as possible. During the replacement of blood, a sterile vaginal examination should be done. If the patient is not

in labor, the infant a previable premature, and there is minimal bleeding and a closed cervix on sterile vaginal examination, do nothing. Some of these patients do no further bleeding and can be delivered at or near term. If the patient is not in labor, has an adequate pelvis, abruptio is mild, and the cervix is ripe, rupture membranes and await delivery from below.

If the patient is in labor with a mild abruptio, rupture membranes. Labor is usually rapid in these cases. Deliver the infant as soon as it can be safely accomplished.

In the patient with a serious abruptio, and in shock, not in labor, and with a ripe cervix, treat shock, rupture membranes, and observe carefully for a few hours. If blood replacement is going to be difficult, do laparotrachelotomy under local anesthesia. If labor does not begin shortly after rupture of membranes and stimulation with pitocin (usual induction dosage), section as above.

In the patient with serious abruptio in labor, rupture membranes unless the infiltration of blood is great enough to paralyze the uterine musculature. Labor will usually terminate spontaneously within a short period.

In the event the patient with serious abruptio has a long closed cervix, laparotrachelotomy under local anesthesia is universally adopted as the best plan of treatment.

Any forcible dilation of the cervix, forceps on a floating head, or high forceps, and Braxton-Hicks version are all mentioned as to be condemned as poor forms of treatment. Packing the lower uterine segment and vagina only hides the bleeding and does not produce a good effect. The Spanish windlass has a place in the treatment of this condition. Version and extraction, if all conditions are right, at times, has a place in the treatment. Scalp traction is useful to hasten labor when the contractions are weak and ineffectual. If the breech is presenting, the anterior leg may be brought down as soon as dilation permits.

The third or placental stage of labor is very important because additional blood loss at this period may seriously jeopardize the patient's life. A high percentage of these patients have postpartum hemorrhage from uterine atony caused by infiltration into the uterine muscle by blood elements. This can be counteracted to some extent by giving an intravenous oxytocic drug with delivery of the anterior shoulder and then a slow delivery of the infant's body. It is very important to save blood in an individual who is already depleted of red cells. If the uterus does not contract promptly, the hand should be introduced into the uterine cavity, the oxytocic drug repeated intravenously, and the uterus massaged and anteflexed with the outside hand while the inside hand acts as a foreign body for the uterus to contract upon. If this does not counteract atony promptly, then the uterus should be packed once properly with a six yard gauze strip four inches wide. The packing should include the vagina. If bleeding occurs through the pack, a hysterectomy should be promptly performed. If one pack properly placed does not control bleeding, do not waste time and good blood by repacking. The additional blood loss may be just enough to tip the scales against the patient.

In the event the operator decides against vaginal delivery, or in the event that labor did not progress properly and cesarean section is decided upon, the uterus may present a picture described by Couvelaire—serosal hemorrhages in the broad ligaments and cul-da-sac. This may result in the inability of the corpus to contract after the infant is delivered, producing uncontrollable hemorrhage. Should atony which fails to respond to oxytocic drugs be present, it may be necessary to do a hysterectomy. Some of these uteri, in spite of rather extensive gross pathology, contract satisfactorily, and the section can be completed without further trouble.

Previously outlined treatment should serve as a guide in the management of abruptio placenta. The careful obstetrician plans ahead and is not bewildered by the

emergencies that arise. The plan for management of abruptio should be flexible and fitted to the individual case. Only in this way can one case be delivered from below and the next case equally serious be delivered with equal safety by cesarean section.

It has been noted almost from the first description of abruptio placenta that certain serious cases have marked hemorrhagic tendencies in spite of adequate blood replacement. These patients exhibit marked loss of fibrinogen, reduction of prothrombin activity, and presence of a circulating fibrinolysin. In a recent paper by Weiner et al. they conclude that the above changes occur as a result of the premature separation.[8]

The statistical data is frightfully misleading in abruptio placenta. The maternal mortality in mild cases is almost nil but is very high in severe cases. The over-all mortality is between 5 and 10 per cent. The infant mortality is low in mild cases but approaches 100 per cent in severe cases.

SUMMARY

1. Abruptio placenta is most often associated with cardiovascular renal disease.
2. Severe abdominal pain with increased uterine tone are the most constant findings.
3. Treatment should be determined by the condition of the cervix and severity of the separation. The method of treatment should be fitted to the individual patient.
4. To replace blood loss and empty the uterus as soon as possible are the prime aims of treatment.
5. Postpartum hemorrhage is common and should be treated vigorously.

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THE HEADACHE PROBLEM*

BRYANT P. SMITH, M. D†

SHREVEPORT

Because headache means to many patients the presence of sinusitis, the differential diagnosis of this condition has become of unusual importance to the rhinologist but since headache can be the result of so many diverse conditions this feat is by no means easy to accomplish.

Before proceeding further with this discussion it is best to consider what is meant by the term *headache*. In this paper headache will be considered to be pain felt inside the head. This will eliminate from discussion indefinite sensations felt in the head and variously described by the patient as a feeling of a tight band around the head, feeling of a brick pressing on the forehead, or a sensation as though the head was expanding.

Stedman's medical dictionary defines headache as a diffuse pain in various parts of the head, not confined to the distribution of any nerve. *Neuralgia* is defined as a pain of a severe throbbing or stabbing character in the course of distribution of a nerve. The majority of headaches are the result of dilatation of the intracranial and extracranial blood vessels and follow the course of these vessels.

Spriggs[1] reported that 10 per cent of 4796 consecutive patients gave headache as their chief complaint and that in only 3 per cent of cases was the headache found to be due to nasal disease.

Regardless of this fact as the ear, nose and throat physician is often first consulted it is important that he be fully cognizant

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†Eye, Ear, Nose & Throat Section, Highland Clinic, Shreveport, La.

of the problem and work closely with the internist, neurosurgeon and ophthalmologist.

I feel that most of us with a busy practice do not take the time that we should to obtain a careful history in these cases as this will usually reduce the etiological possibilities. Some of the important factors to be discussed in obtaining the history are:

1. Age at onset, whether or not the headache is associated with puberty, menstruation, menopause, family history, physical exposures, fatigue, constipation, allergy.

2. Quality of pain, whether of the superficial or burning type or of the deep, throbbing variety, and whether or not the pain is referred. McAuliffe, Goodell and Wolf[2] have found the headache of acute and chronic sinusitis to be of the deep, nonpulsating variety, not referred, and of low intensity.

3. Location: unilateral, bilateral, and if it recurs in same or different location.

4. Type of onset: sudden or slow build up and termination, duration, periodicity, effect of position.

5. Effect of exercise.

6. Effect of drugs in relieving.

According to investigation by Lewis[3] and Wolf the pain sensitive structures of the head exclusive of the sensory nerves are:

1. Nasal mucosa, especially ostia of sinuses.

2. Mucosa lining accessory sinuses of nose.

3. The larger extracranial and intracranial blood vessels and adjacent dura.

4. Fibrous tissues about the head and neck.

5. Muscular tissues about the head and neck.

CLASSIFICATION OF HEADACHE

A. Independent Forms.
   1. Migraine.
   2. Tension states, nervous exhaustion, psychogenic.
   3. Posterior neck conditions: myalgia, nodular induration, hypertonic neck muscles, fibrositis, arthritis of cervical spine.
   4. Erythromelalgia of the head.

B. Headache associated with disease of individual organs.
   1. Brain diseases: tumor, abscess, meningitis, encephalitis, hydrocephalus, pachymeningitis interna, cerebral and cerebrospinal syphilis, cerebral arteriosclerosis, epilepsy, post-traumatic.
   2. Ear diseases: otitis media, purulent, acute; mastoiditis and complications.
   3. Eyes: refractive errors, muscle imbalance, congestive glaucoma. Inflammatory conditions: keratitis, uveitis, optic neuritis, etc.
   4. Nose and sinuses: Contact septum with turbinate, empyema, sphenopalatine neuralgia.
   5. Teeth.
   6. Digestive tract: kidneys, pelvis.

C. Headache in general disease.
   1. Infectious diseases.
   2. Acute and chronic intoxications, alcohol, tobacco, lead poisoning, etc.
   3. Constitutional disorders: endocrines, anemias.
   4. Histamine.

It is beyond the scope of this paper to thoroughly discuss all the known causes of headache but some of the main characteristics of the more common forms will be given with particular attention being paid to those of E. N. T. origin.

INDEPENDENT FORMS. 1. MIGRAINE

Migraine, more commonly known as "sick headache," is characterized by periodic paroxysms of intense pain preceded or accompanied by characteristic sensory or motor disturbances or their combination along with general vasomotor or psychic phenomena. The most frequent beginning site is in the neighborhood of an eye, either above, lateral to or deep. There is a tendency for the pain to become diffuse and involve the whole side of the head or become generalized.

The patient may describe the pain as dull, boring, pressing, throbbing, hammering, viselike or shooting. The pain tends to increase gradually to an intense height.

The headaches may last one to several days. It may begin with an aura. Nausea

and vomiting are usually present with anorexia during the attack. The patient is irritable, complains of photophobia and abhors noise.

A variety of conditions seem to have a role in precipitating attacks, such as mental and emotional excitement, fatigue, dietary indiscretions, menstruation.

Puberty is the most frequent time of onset. It is twice as common in females as in males.

Treatment consists of avoiding the factors which precipitate attacks and giving ergotamine tartrate or a similar acting drug as soon as possible.

There are several theories as to etiology; the most likely is that it is a vasomotor reaction involving the branches of the external carotid arteries.

2. NERVOUS AND MENTAL STATES

The incidence of headache which is designated as neurasthenic or psychogenic is apparently very great. When evidence is lacking to ascribe the headache to any specific cause, the usual conclusion is that the disturbance rests on a neurasthenic or psychogenic basis. Diagnosis is made primarily on a careful history, and secondarily, on the absence of reasonable factors discernible to objective examination.

3. POSTERIOR NECK CONDITIONS

Myalgia is characterized by tender areas in muscles due to physical or intrinsic allergy. Symptoms are exaggerated by rainy weather, drafts, air conditioning. It is relieved by injections of procaine, vasodilators; salicylates usually give little or no relief.

Primary fibrositis is of unknown etiology. It is not related to joint disease. Pain is not constant in location and is of the burning variety. Atmospheric changes tend to produce exacerbations. Temporary relief is obtained by heat, massage, and salicylates. Vasodilators are of no help.

Clinical examination will usually rule out the ear as a cause of headaches; however, the neurosurgeon may be of great help in the intracranial complications as he is invaluable in locating the cause of headache in expanding lesions and inflammations of the meninges.

EYE DISEASES

Certainly every patient with headache of one month's duration should have ophthalmoscopic examination to rule out papilledema. The ophthalmologist also may be of aid to the neurosurgeon by doing quantitative visual fields. Other eye conditions which must be ruled out are:

1. Refractive errors (history helps).
2. Phorias:
   - A. Vertical.
   - B. Horizontal.
     - a. esophoria; convergence excess or divergence insufficiency.
     - b. exophoria; convergence insufficiency or divergence excess.
3. Congestive glaucoma.
4. Inflammatory conditions: uveitis, retro-bulbar neuritis, etc.

NOSE AND SINUSES

Sinusitis: Contrary to the thoughts of most patients and some physicians chronic sinusitis rarely produces headache. This is not true, however, of acute sinusitis and acute exacerbation of chronic sinusitis.

In diagnosing headache of sinus origin pain is of little localizing value as an acute maxillary sinusitis will often have pain in the frontal region. Tenderness is of marked diagnostic value.

Tenderness:

a. Ewing's point—usually means frontal sinusitis.
b. Supra and infraorbital foramenia indicates neuritis which arises from contiguous sinus or remote area.
c. Ethmoid region—indicates anterior ethmoiditis.
d. Canine fossa—indicates maxillary sinusitis.
e. Sluder's point behind ear—indicates posterior ethmoiditis, sphenoiditis or spheno-palatine neuritis.

The pain in above conditions may be due to:

a. Positive or negative pressure in a blocked sinus.
b. Necrosis of the lining membrane with osteitis.
c. Neuritis of adjacent nerves.

In addition to previously mentioned causes of headache of nasal origin contact of mucosal surfaces of turbinates and septum either of vasomotor or allergic origin may be at fault. Simple shrinkage will make the diagnosis of these cases. Treatment depends upon the cause.

Spheno-Palatine Neuralgia: Sluder popularized lower half headache radiating to ear, neck and shoulder with tenderness at Sluder's point.

Causes:

A. Contact of septum with:
   1. Posterior tip of middle turbinate.
   2. Spheno-ethmoid recess.

B. Inflammation in posterior group of sinuses.

Treatment: cocainization of ganglion or involved sinus.

Histamine Cephalgia: Horton[4] and associates have thoroughly discussed this clinical picture consisting of severe unilateral headache with sudden onset and termination, accompanied by vasomotor rhinitis, conjunctival injection, and lacrimation on homolateral side. It may occur during sleep and be less severe in erect position. It may be precipitated by alcohol. The absence of visual disturbances, nausea and vomiting differentiates the attacks from migraine and seldom is there an inherited tendency. The absence of trigger areas and the fact that the distribution is vascular and not confined to the branches of the trigeminal nerve distinguishes it from tic douloureux.

Diagnosis is made by the symptoms and by headache being relieved by pressure over the carotid or by intravenous injection of 3 to 5 mm. 1-1000 epinephrine.

Treatment is by intravenous or subcutaneous injections of histamine, 1-250,000 sol. by vein 30-40 drops per minute. Duration of infusion should be one to one and a half hours. Rate of flow is what is important when giving by vein.

When given by subcutaneous route the total dose and not the rate of injection is important. In office management the usual subcutaneous dose is 0.2 cc. of standard solution (histamine acid phosphate 2.75 mg. in 5 cc). Dose is increased 0.2 cc. daily until 0.5 cc. is reached. This amount is given two or three times weekly. Patient should remain quiet from twenty to thirty minutes after each injection. If unbearable headache is produced 3 to 5 minims of epinephrine are given for relief. Benadryl 50 mg. is usually given the night after the injection to terminate the histamine reaction and serve as a sedative.

After three or four weeks nicotinic acid, 50 mg., is given orally t.i.d. on days when no histamine is given.

SUMMARY AND CONCLUSIONS

In this paper no claim is made of any original work on this subject but from a review of current medical literature a clinical classification of headache is given with a review of signs and symptoms of some of the major causes with especial attention being paid to those of E.N.T. origin.

Only brief mention of treatment is given as it is felt that the diagnosis is what is most important as treatment can be found in any standard textbooks after etiology has been ascertained.

As many patients feel that their headaches are of sinus origin the E.N.T. physician may be the first consulted. He should, therefore, be conversant with headaches in general and work closely with the internist, neurosurgeon, and ophthalmologist in determining etiology and treatment.

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THE PROBLEM OF THE DIZZY PATIENT*

MILES L. LEWIS, JR., M. D.
NEW ORLEANS

One of the most distressing symptoms which brings a patient to the physician's office is dizziness or vertigo. True vertigo may be defined as a sensation of whirling motion, either of the patient or his surroundings. It is conceded by most authorities that true vertigo is caused by conditions affecting the vestibular apparatus.

Unfortunately, the problem of proper diagnosis and management of these patients is complex and not always solvable. The most important point in evaluation of any case of dizziness is determination of the exact sensation the patient is experiencing. He may be having dizziness, light-headedness, confusion, syncope, difficulty in gait, or true vertigo. Ask him to try to describe his sensations. Is it the same feeling he gets when he looks down from high places? Does he feel faint, does he fall or lose consciousness, or is it the sensation he might get after riding on a merry-go-round? The best means of helping the patient describe his sensations is the caloric test. The patient can compare the sensation he is complaining of with the sensation produced by the test.

All these symptoms are manifestations of a disturbance in equilibrium. Equilibrium is dependent upon sensory impulses arising from (1) exteroceptive nerve endings (eyes, touch, pressure and cutaneous temperature); (2) proprioceptive nerve endings (muscle, tendon and joint endings, and the vestibular end organs in the semicircular canals and utricle); and finally, (3) the higher cerebral centers.

For convenience of discussion cases of vertigo and dizziness may be classified into those of peripheral origin, those of central origin and those due to other causes.

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From the Departments of Otolaryngology, Ochsner Clinic and Tulane University of Louisiana, School of Medicine, New Orleans.

PERIPHERAL ORIGIN

Vertigo of peripheral origin is due to conditions affecting the vestibular end organs or the eighth cranial nerve. It is characterized by associated movements such as past pointing, by severe vertigo, nausea and vomiting, the associated auditory phenomena of tinnitus and deafness, and a peripheral type nystagmus which is regular, composed of a quick and slow component, and usually horizontal.

Vertigo of peripheral origin may be produced by numerous conditions. Pressure on the drum head may be caused by impacted cerumen, a foreign body or external otitis. Obstruction of the eustachian tube due to allergy, inflammation or neoplasm can cause severe vertigo; in these patients the nasopharynx should be examined and tubal patency tested.

Moderate to severe peripheral type vertigo occasionally accompanies acute otitis media but in such cases the diagnosis and treatment are apparent. Labyrinthitis, actual inflammation of the membranous labyrinth, occurs rather rarely today and always is secondary to acute or chronic otitis media or mastoiditis. These patients usually lie on the normal side to decrease the nystagmus and vertigo. Loss of auditory and vestibular functions indicates suppurative labyrinthitis, which should be treated surgically. However, if these functions are retained, the inflammation is of the serous type and more conservative treatment is indicated. Labyrinthine fistula occurs in the horizontal canal secondary to cholesteotoma of the mastoid and is diagnosed by a positive reaction to the fistula test. Treatment of this condition is surgical.

Fracture of the temporal bone or concussion of the inner ear from head injury causes severe vertigo, usually accompanied by tinnitus and deafness, and facial paralysis may also be present. Neurolabyrinthitis, or toxic neuritis of the eighth nerve, is encountered frequently; these cases are usually referred to as "labyrinthitis" by the internist. They may be due to hypersensitivity to drugs, such as quinine, salicylates, alcohol, or morphine, or they may result

from systemic or focal infection. The symptoms last from a few days to a few weeks. Treatment consists in removal of the etiologic agent.

The blood supply of the inner ear is the internal auditory artery, which is an end artery. Obstruction of this artery, whether by thrombus, embolus, or spasm, causes a typical picture of severe vertigo, roaring tinnitus, severe deafness, and nausea and vomiting of sudden onset. These symptoms are severe for several days. The patient lies in bed without moving his head. Gradually over a period of weeks the vertigo, nausea and vomiting clear up. The tinnitus decreases in intensity and the patient returns to normal activity. The deafness is usually permanent and mild postural vertigo may continue for several months. If the patient is seen early, vigorous vasodilation may be tried in an effort to re-establish the blood supply. However, treatment is ordinarily confined to sedation, restoration of fluid balance and reassurance.

There is a widespread but unfounded belief that tumors of the cerebellopontine angle often cause severe vertigo. The usual manifestations are severe nerve type deafness, tinnitus of long duration, and corneal anesthesia on the involved side. Occasionally moderate vertigo is present. Roentgenographic evidence of enlargement of the internal auditory meatus, when present, confirms the diagnosis.

Much confusion has existed concerning Ménière's disease or endolymphatic hydrops. This is a distinct clinical entity, the pathology of which is well known. The etiology is obscure but is considered by many to be due to hypersecretion of endolymph. This diagnosis should be reserved for patients experiencing paroxysmal episodes of severe vertigo, accompanied by a roaring tinnitus, nerve type deafness, and nausea and vomiting. These patients are usually women in the third or fourth decade of life, who may have an allergic history and are extremely apprehensive about their attacks. Examination usually reveals no abnormalities except a nerve type deafness, usually unilateral, and possibly a hypoactive response to caloric stimulation in the involved ear. The patient always states that the vertigo he has is much more severe than that produced by the caloric test. Medical treatment of Ménière's disease consists in limiting fluid intake, low sodium diet, and use of diuretics, vasodilator drugs such as nicotinic acid, histamine and atropine-like drugs, sedation and in rare cases streptomycin destruction of labyrinthine function. Surgical treatment is occasionally employed in severe unilateral cases which do not respond to a medical regimen; destructive labyrinthotomy is the procedure of choice and has largely replaced hemisection of the eighth nerve.

CENTRAL ORIGIN

Vertigo of central origin is not as severe as that of peripheral origin, and is often positional and transient; auditory phenomena are not usually present and the nystagmus is of the central type. Conditions affecting the vestibular nuclei and tracts produce this type of vertigo.

Arteriosclerosis of the central nervous system is the commonest cause of vertigo that we see. The vertigo is probably due to a diminished blood supply to the vestibular nuclei and tracts. It is usually mild, is often positional and responds poorly to treatment. Dramamine and sedation are often beneficial, and spontaneous remissions may occur.

Hypertension usually produces dizziness rather than vertigo; it is worse when the blood pressure is high and responds to measures which lower the blood pressure. Vertigo is a prominent symptom of the post-concussion syndrome, often persisting for many months after the initial injury.

One-third of the patients with cerebellar abscess or tumor have true vertigo. Usually other cerebellar signs are present. Tumors of the fourth ventricle may cause recurrent episodes of vertigo which can be confused with Ménière's disease. Degenerative diseases of the central nervous system may involve the vestibular nuclei and pathways and produce vertigo. The principal offender is multiple sclerosis in which 10 per cent of patients complain of vertigo

as the initial symptom. Other diseases in this category are syphilis, syringomyelia, and poliomyelitis.

OTHER CAUSES

There are numerous other causes of dizziness and vertigo which do not directly affect the vestibular apparatus. Most of these conditions cause dizziness or imbalance and not true vertigo. Cerebral anemia often produces dizziness and even syncope. It may be caused by hypotension, anemia, vasomotor instability or cardiac decompensation. Various metabolic disturbances, such as hypoglycemia, endocrine disorders and the menopausal syndrome, often produce dizziness. Some patients with migraine complain of mild true vertigo. Ocular vertigo is a misnomer. Various ocular conditions, such as muscle imbalance, refractive errors, and glaucoma, produce giddiness or dizziness but not vertigo. Here the diagnosis is simple; if the sensation is not relieved by closing the eyes, then other causes should be considered. Undoubtedly many cases of dizziness are on a psychogenic basis. The reaction to caloric stimulation is of great value in these patients. Lastly, disturbances in gait may be confused with vertigo or dizziness.

SUMMARY

As can be seen, a multitude of conditions may cause dizziness and vertigo. The most important diagnostic point is determination of what the patient means when he says he is dizzy. In general, severe vertigo, especially when associated with tinnitus and deafness, is due to labyrinthine disease. Milder positional vertigo is usually central in origin. Dizziness not due to labyrinthine disease may be caused by systemic disease, metabolic, or endocrine disorders or ocular disease, or it may be psychogenic.

Complete examination of the ear, nose, and throat including evaluation of labyrinthine and auditory function, a thorough medical examination and even neurological and ocular examinations may be necessary in many patients before the proper diagnosis can be made.

DISCUSSION

Dr. Adrian B. Cairns (New Orleans): True vertigo as Dr. Lewis pointed out is defined as a sensation of whirling motion, either of the patient or of his surroundings. It may be imitated by stimulating the labyrinth with ice water.

A large number of patients are referred to the otolaryngologist with the chief complaint of dizziness or vertigo. For this reason it is important to know that a patient who has a serious labyrinthine disturbance usually has associated pathology of the cochlea. The reverse is not always true. An audiometric examination will act as a screening test and in such serious conditions as Menières disease, cerebellopontine angle tumors and suppurative labyrinthitis there will always be an associated hearing loss.

I would like to discuss briefly two conditions that we see often:

1. Vertigo due to eustachian tube blockage. The patient has true vertigo as the labyrinth is stimulated by the negative pressure in the middle ear. The cause of the tubal blockage should be determined and eradicated.

2. Anxiety state. This is a very common cause of dizziness. The patient is usually of the nervous type. In these cases the patient does not have a true vertigo and on close questioning will be found to have more of an unsteadiness. Hearing is usually normal. The caloric response does not resemble the spells, and the patient will tell you that the test is much worse than the spells. However, we should never forget that nervous patients can have serious organic conditions.

In conclusion I would like to emphasize that the problem of the dizzy patient is a challenge to the otolaryngologist and will require further study and research.

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DIABETES AND THE DIABETES DETECTION DRIVE

The week of November 11-17, 1951, will be Diabetes Week. This is the week in which the Annual Diabetes Detection Drive will be made.

The American Diabetes Association has for the past three years sponsored and organized a continuous and nationwide effort to find out who the people are who have diabetes and do not know it. Along with this case finding program is the health educational program, which is sponsored and directly conducted by the medical profession working through the local medical societies.

The disease, which is in the nature of its composition incurable and which has a million acknowledged cases already, is important to the medical profession in every aspect of its practice. It is realized that there are probably a million diabetics unknown to themselves and to their doctors, and still two million more, who are going to become diabetics, among those now living. The importance of diabetes and diabetic detection drives in this situation is readily manifest.

The activities of the American Diabetes Association in this regard are most commendable. It is the only national organization in this field. It was originally founded in 1940 by physicians who were deeply concerned over the growing problem of diabetes in this country. The membership is still largely medical and includes more than 1400 physicians whose interests are intimately connected with the problem of diabetes. The association is the only one of those currently vocal in this country in which the primary initiative was and remains principally that of physicians. The objectives of the association are:

To find the greatest number possible of yet-undiscovered diabetics.

To assist diabetics in their efforts to lead normal lives.

To improve the treatment of diabetes.

To bring the newest information about the disease to all interested physicans.

To encourage and support research on diabetes.

To promote public knowledge about diabetes and understanding of the individual diabetic's problem.

The compilation of the results of Diabetes Week in 1950 supports the aims of the Association. It is found in general that the

proportion of newly discovered cases of diabetes to the total number of people tested ran between 0.5 and 1 per cent. It seems clear from considerations of this sort and other data which are available that the actual number of diabetics is increasing. Analysis of the incidence of diabetes in over 45,000 selectees shows the disease is 3 to 4 times as prevalent among young adults as has hitherto been known on the basis of earlier studies.

The increase in the actual number of diabetics is in part, no doubt, due to aging of our population. Heredity is regarded as being a factor. A predisposition to diabetes is apparently inherited as a Mendelian recessive characteristic. It has been variously estimated that approximately 1 out of every 4 persons is "a diabetes carrier." Obesity is also associated with the greater incidence of diabetes. Theories to explain this are various. Whatever these theories may be, it is obvious that under such circumstances more food material is taken in and less muscular energy is expended. A burden upon the mechanism of metabolism results. Additional theories are concerned with the endocrines and with the complicated balance of forces that is maintained between them. Regardless of the theories, the best service the physician can do for the diabetic is to arrange his methods of practice so that the diabetic may be detected as early as possible, and when detected, the physician can then direct the course of the disease so that its ravages will be minimized.

In an article in the September 15 Journal of the A. M. A., Joslin shows that the controlled diabetic has an outlook that was little dreamed of twenty-five years ago. He reports in a study of 760 diabetic patients suffering from the disease for twenty-five years or more that approximately 80 per cent were active, and a few were in perfect health. He states:

"The patients in perfect condition are those whose treatment was initiated (with hardly an exception) with strenuous control of diabetes in their early years; this control being maintained for ten years, more or less, to more than the usual extent and even then continued.

"In this series the evidence is overwhelming that strict treatment of diabetes pays and, moreover, that control of the disease is possible."

In any detection drive it is expected that there will be borderline cases. These are likely to be referred to the proper quarters for glucose tolerance tests. This test does not actually measure the tolerance for sugar; it does not show the capacity of the patient to utilize his food. In recent years this test has been subjected to a variety of interpretations. Among its critics, Soskin feels that it is of value only if the glucose is given intravenously, and if due consideration is given to the action of the liver in interpreting the test. While possibly confusing in some instances, the glucose tolerance test seems a useful guide in the study of many borderline cases.

The Chairman of the Committee of the American Diabetic Association for Louisiana this year, as in the three years past, is Dr. Arthur A. Herold of Shreveport. The burden of organizing and directing the work will fall upon him. The effectiveness of the drive, however, will depend upon local cooperation, and its value to medical public relations will be in proportion to the effort exerted. The lessons of the last fifteen years have taught that the doctor must not only treat disease but he must be active in arranging for its prevention, detection, and prospective care before it develops. Accordingly, it is much in the public interest and in the interests of the profession to find the greatest number possible of yet-undiscovered diabetics.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

COMMUNICATIONS

Following is an article received by the secretary-treasurer from Colonel David E. Liston, Surgeon, Medical Corps, Headquarters Fourth Army, concerning reimbursement for medical services rendered Army personnel.

CIVILIAN MEDICAL CARE FOR THE ARMY

One of the most important and necessary services furnished the American soldier is adequate and timely medical care and treatment, including hospitalization. This service is provided for Army personnel in the United States generally by dispensaries, infirmaries, and hospitals located at the many Army installations throughout the country. There are many locations, however, where Army or other United States federal medical treatment facilities are not available when medical service is required by Army personnel. In cases of this nature, the services of civilian physicians, clinics, and hospitals are necessary. With the expansion of the Army and the deployment of Army personnel to practically all points in the United States either on a duty, travel, or leave status, the continued cooperation of civilian physicians and agencies is of utmost importance in providing adequate medical service to the U. S. soldier in time of need.

Certain criteria and procedures have been established in connection with the furnishing of medical service to Army personnel by civilians in accordance with the current laws and regulations. These criteria define the conditions under which individuals of the Army may be authorized civilian medical care at the expense of the Army. These procedures include methods for reporting and receiving payment for treatment or hospitalization of Army personnel by the civilian medical agencies.

Civilian medical care (other than elective) at the expense of the Army is authorized for commissioned officers, contract surgeons when employed by the Army on a full-time basis, warrant officers, enlisted personnel, cadets of the United States Military Academy, general prisoners and prisoners of war when these personnel are on a duty status or when they are absent from their place of duty on leave or informal leave (pass) status. Applicants for enlistment in the Army and selectees also are authorized necessary civilian medical care at the expense of Army funds while they are being processed for enlistment or induction into the Army. Payment for civilian medical expenses incurred by Army personnel who are absent without leave is not authorized. Any obligations resulting from civilian medical care to Army personnel who are absent without leave are the responsibility of the Army individual concerned.

Normally, civilian medical care for Army personnel is authorized only when there are no other federal medical treatment facilities available. First aid or emergency treatment is authorized at any time, notwithstanding the proximity of Army or other federal medical treatment facilities. In this connection, emergency medical care may be defined as that required to save life, limb, or prevent great suffering. Surgical operations should not be performed without prior approval of military authorities, unless indicated as an emergency procedure. Elective medical treatment in civilian medical treatment facilities or by civilian physicians will not be authorized as Army funds cannot be used for payment of these services.

Due to the limitation of funds available to the Army, dependents of military personnel may obtain available medical care at Department of Defense medical facilities only.

Any obligations resulting from civilian medical care to dependents of military personnel are the responsibility of the dependents concerned or their sponsors.

As a general rule, local military commanders will furnish the civilian medical agency with prior written authority for ordinary medical care to Army personnel under his jurisdiction. In such cases, prior arrangements with the civilian medical agency will be made by the individual or by a proper military authority. For emergency cases treated without prior written authorization, the surgeon of the nearest military command should immediately be notified by the civilian medical agency, giving the individual's name, organization, nature of illness or injury and statement of the practicability of transfer of the patient to an Army or other governmental hospital. The civilian agency or physician then will be advised without delay by the appropriate military authorities as to procedures to be followed.

Bills for authorized medical care and treatment of Army personnel should be submitted to the commanding officer of the organization to which the patient belongs, or to the military authority who provided the authorization for the medical service. If the location of these individuals is not readily known or if such military commanders authorizing treatment have moved to another station, the bill should be sent to the military authority listed below.

For Services rendered in the following states:

FOURTH ARMY AREA

Arkansas, Louisiana, New Mexico, Oklahoma, Texas, submit bills to The Surgeon, Fourth Army, Fort Sam Houston, Texas.

SOCIALIZED MEDICINE

It is felt by the secretary-treasurer that the following letter received from Dr. Elmer Hess, President of the American Urological Association should be of interest to every member of the State Society and it would be worthwhile to follow the suggestion included in this communication.

Dear Doctor:

You have many times been thanked sincerely, gratefully, even profusely, almost to the point of embarrassment for a life-saving or a health-restoring service. What a made-to-order opportunity is presented by such an occasion to plant into the minds of grateful patients the seeds of the simple truth that socialized medicine is national socialism. Ask your patients whether they think they would have fared as well under a political medical system, with production line guessing for diagnosis and treatment and with a politically appointed physician whose compensation would depend more upon his political connections than upon the quality of service he renders.

Remind your patients of the additional payroll deduction that would be necessary if the government furnishes free medical care. Miss no opportunity to enlighten them concerning the facts. The voice of an increasing total of grateful patients thus informed and converted by you and your confreres will gradually but inevitably have its influence in moulding public opinion. Supplementing the efforts of organized groups, this much we as individuals can and should do if we will only put forth the effort and have the will to do it.

Will you address at least 5 copies of this letter to physicians of your acquaintance? This will cost you a maximum of 15 cents and perhaps an hour of your secretary's time. Do it now and don't forget and neglect the assignment which you have given to others. Remind each grateful patient during his treatment and at the time of his dismissal from your care where his better interests lie. Let him know that this fight against socialized medicine is really not the doctor's fight but the people's fight to preserve for themselves the best quality medical care that any nation has ever enjoyed and that the whole fight is against national socialism.

Cordially yours,
Elmer Hess, M.D.
President
American Urological
Association

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Third Thursday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

DIABETES WEEK

Diabetes Week (November 11-17) will again spearhead the American Diabetes Association's nationwide Diabetes Detection Drive, the fourth sponsored by this Association.

The year-round Diabetes Detection program, approved by the American Medical Association, is the only broad health education and case finding program developed exclusively by the medical profession. Its objectives are twofold: (1) to further the detection of diabetes among the public; and (2) to disseminate general information about the disease.

Twenty-eight State Medical Societies, over 500 County Medical Societies, and the 28 Affiliate Associations have already established Committees on Diabetes. In Louisiana, in addition to the State Medical Society Committee, chaired by Doctor A. A. Herold, Sr., approximately five County Medical Societies will cooperate in this year's Drive.

Both state and county-wide detection programs will be conducted in Louisiana this fall. The American Diabetes Association recommends that detection programs be organized with the cooperation and participation of County and State Medical Societies.

In past surveys, urine tests have been made by Benedict's method, Clinitest or Galatest. The latter are simple and time-saving means of testing for glycosuria. The reagents, however, must be fresh to give dependable results. Doubtful tests should be checked with Benedict's solution. Standard blood sugar techniques, as the Folin-Wu or Somogyi procedures, should be used for follow-up tests.

The principle of self-testing for glycosuria was approved by the Council of the American Diabetes Association, June 5, 1949, and by the House of Delegates, American Medical Association, June 28, 1950. Many State and County Medical Societies have already taken similar action. Self-testing units contain directions for use and instructions to report all positive findings to family physicians for confirmatory diagnosis.

By way of caution, some mild cases of diabetes may not be discovered on initial examinations unless:

A test is made one to three hours after a full meal—preferably ninety minutes.

A blood sugar test is made in addition to the urinalysis.

ANNUAL MEETING OF THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The fifteenth annual meeting of The New Orleans Graduate Medical Assembly will be held March 10-13, headquarters at the Municipal Auditorium.

Listed below are the Chairmen and Vice- Chairmen of the Program Committees:

Anesthesiology—Dr. Frank L. Faust, Chairman; Dr. John Adriani, Vice-chairman.

Dermatology—Dr. M. T. Van Studdiford, Chairman; Dr. Barrett Kennedy, Vice-chairman

Gastroenterology—Dr. Jules Myron Davidson, Chairman; Dr. Benjamin O. Morrison, Vice-chairman.

Gynecology—Dr. E. Perry Thomas, Chairman; Dr. John C. Weed, Vice-chairman.

Medicine—Dr. Joseph S. D'Antoni, Chairman; Dr. Louis Monte, Vice-chairman.

Neuropsychiatry—Dr. T. A. Watters, Chairman; Dr. Dean H. Echols, Vice-chairman.

Obstetrics—Dr. Curtis Lund, Chairman; Dr. E. L. King, Vice-chairman

Ophthalmology—Dr. George M. Haik, Chairman; Dr. William B. Clark, Vice-chairman.

Orthopedic Surgery—Dr. Guy A. Caldwell, Chairman; Dr. James L. Lenoir, Vice-chairman.

Otolaryngology—Dr. H. Ashton Thomas, Chairman; Dr. Francis E. LeJeune, Vice-chairman.

Pathology—Dr. Edwin H. Lawson, Chairman; Dr. William H. Harris, Vice-chairman.

Pediatrics—Dr. Ruth G. Aleman, Chairman; Dr. John Henry Dent, Vice-chairman.

Radiology—Dr. Joseph N. Ane, Chairman; Dr. Richard C. Boyer, Vice-chairman.

Surgery—Dr. James D. Rives, Chairman; Dr. M. M. Hattaway, Vice-chairman.

Urology—Dr. Edgar Burns, Chairman; Dr. Gilbert C. Tomskey, Vice-chairman.

The program is being arranged and promises to be one of the most interesting this Assembly has ever had.

CHILD HEALTH PROGRAM

The Child Health Committee of the Louisiana State Medical Society is arranging to meet in Alexandria during the early part of November, with representatives of various educational groups and with as many representatives of parish societies as can attend. The object of this meeting is to coordinate the efforts of the various agencies who are working in the Child Health Program, and to bring about a proper coordination between the school authorities, the physicians, and the representatives of the lay public. The operation of coordinated effort of this type in the parishes of Tangipahoa and Iberville has resulted in a very satisfactory situation in which the children were examined and the private practice of medicine was supported. It is felt that this is not strictly a pediatric problem. The general practitioner and the physicians practicing in the various specialties have equal responsibilities.

SUMMER MEETING OF THE LOUISIANA HEALTH COUNCIL

The Louisiana Health Council had its summer meeting in Baton Rouge, August 15 and 16, on the L. S. U. Campus. Mr. H. C. Sanders presided over the meeting. The Wednesday afternoon meeting was directed towards nurses recruitment and three important speakers presented facts relative to that subject. The Thursday morning session was given over to Health Council organization and an important talk was given by Dr. M. C. Wiginton of Hammond. His talk was followed by the symposium on the Public Health Service of the State Health Department with Dr. S. J. Phillips as chairman. The meeting was very well attended and much interest was shown. Dr. Wiginton and Dr. J. P. Sanders, were the only representatives present of the State Medical Society.

DR. TALBOT HONORED

At the July, 1951, meeting of the Orleans Parish Medical Society, a proposal was signed by all members of the Board of Directors nominating Dr. P. T. Talbot for honorary membership in the Orleans Parish Medical Society. Dr. Talbot, before his retirement in October, 1950, served for thirty two years as Secretary-Treasurer of the Louisiana State Medical Society and as General Manager of the New Orleans Medical and Surgical Journal.

DIODRAST AIDS SURGEONS IN DIAGNOSING BRAIN TUMORS

An effective technic in the diagnosis of brain tumors, intracranial aneurysms and cerebral vascular accidents, involving use of the radiopaque compound Diodrast, is described by Dr. Sidney W. Gross, Mt. Sinai Hospital, New York, in charts prepared for exhibition at medical society meetings.

The technic, which is now being widely employed in neurosurgical clinics whenever such tumors are suspected, was described in detail at the recent meeting of the American Medical Association.

When Diodrast is injected into the common carotid artery, the blood vessels in the head, supplied by this artery, are made visible in X-rays. Brain tumors change the normal pattern of the blood vessels.

GREATER ACCURACY IN LABORATORY DIAGNOSIS

The sick man seeking a diagnosis will soon be getting a sharper picture of his disease condition, from doctor or hospital, than he may have had in the past.

The promise of greater accuracy in laboratory diagnosis results from a service announced by the College of American Pathologists.

This national body of medical specialists is initiating a program which will enable pathologists who direct laboratories to obtain highly standardized chemical solutions for use in performing tests on body fluids.

By checking solutions prepared by their own technicians against the standard solutions supplied them, directors of medical laboratories can thereby increase the reliability of their medical tests, to the immediate benefit of the sick.

Distribution of standardized dextrose and nitrogen solutions to 1450 member pathologists, which began August 30, actually marks the initial step in the development of a comprehensive program for standardization of laboratory procedures, Dr. M. G. Westmoreland, executive secretary of the College of American Pathologists, declared.

MOTION PICTURES ON HEALTH

A revised list of "Sources of Motion Pictures on Health" has been prepared by the Committee on Medical Motion Pictures of the American Medical Association. This new mimeographed list includes 9 pages of addresses of the major loan and rental libraries, the state health departments' film libraries and references to printed lists and catalogs. Copies are available from:

Committee on Medical Motion Pictures
American Medical Association
535 North Dearborn Street
Chicago 10, Illinois

WOMAN'S AUXILIARY TO THE LOUISIANA ACADEMY OF GENERAL PRACTICE

Newly elected officers and appointive chairmen for the Woman's Auxiliary to the Louisiana Academy of General Practice include the following:

Advisory Council: Dr. Marquis C. Wiginton, Hammond; Dr. Eldrege L. Carroll, Columbia, and Dr. Edwin R. Guidry, New Orleans.

Officers: President, Mrs. Edwin R. Guidry, New Orleans; President-elect, Mrs. P. A. Donaldson, Reserve; Vice-president, Mrs. Hollis T. Rogers, Winnsboro; Recording Secretary, Mrs. John N. Bostick, Gilbert; Corresponding Secretary, Mrs. P. P. Labruyere, Marrero; Parliamentarian, Mrs. Floyd M. Hinderland, Gretna; Past President, Councilor and Advisor, Mrs. George D. Feldner, New Orleans.

Chairmen of Special Committees: Convention, Mrs. Carroll Gelbke, New Orleans; Vice-chairman, Mrs. Daniel Murphy, New Oleans; National Building Fund, Mrs. Esmond Fatter, New Orleans; G. P. Wife of the Year, Mrs. M. C. Wiginton, Hammond.

Chairmen of Standing Committees: Archives, Mrs. Cosmo J. Tardo, New Orleans; Budget, Mrs. D. B. Barber, Pineville; Historian, Mrs. C. P. Herrington, Alexandria; Membership, Mrs. John W. Atkinson, Gretna; Printing, Mrs. William Gillaspie, New Orleans; Program, Mrs. Forrest Baker, Gonzales; Publicity, Mrs. C. R. Robinson, New Orleans.

Councilors: First District, Mrs. Vincent Blandino, New Orleans; Second District, Mrs. Frederick A. Wild, Jr., Destrehan; Third District, Mrs. F. H. Davis, Lafayette; Fourth District, Mrs. John G. Pou, Shreveport; Fifth District, Mrs. Eldredge Carroll, Columbia; Sixth District, Mrs. C. P. Lipscomb, Ponchatoula; Seventh District, Mrs. James B. Hodge, Jr., Sulphur; Eighth District, Mrs. Milton Honigman, Alexandria.

WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

An invitation to the New Orleans chairman of the Essay Contest sponsored locally by the Woman's Auxiliary to the Orleans Parish Medical Society, in Louisiana by the Woman's Auxiliary to the Louisiana State Medical Society, and nationally by the American Association of Physicians and Surgeons, and to the local winner of the national award, has been extended to attend the National Convention of the AAPS in Indianapolis, October 4-7.

Pat Baxter, the vivacious seventeen year old McMain graduate, who captured first honors in Louisiana and the nation and who had her prize winning essay 'Why the Private Practice of Medicine Furnishes this Country with the Finest Medical Care" inscribed upon the pages of the Congressional Record, will read her treatise at the Banquet meeting on Friday, October 5. Sharing honors with Pat will be the speaker of the evening, Senator McClelan.

Accompanying Miss Baxter as chaperone will be Mrs. Edwin R. Guidry, who acted as local and state chairman for the contest, and who previously piloted Rose Agnes of Metairie High School to a fourth place prize in last year's contest.

Both Miss Baxter and Mrs. Guidry will fly to the convention as guests of the association. The invitation and the opportunity to so represent New Orleans and Louisiana and the Medical Auxiliaries active in the project are interpreted as a distinct honor and recognition of the part Dr. Edwin L. Zander, president of the Louisiana State Medical Society, has played in this nation wide educational effort to combat compulsory state medical taxation.

SOUTHERN MEDICAL ASSOCIATION AUXILIARY

The meeting of the Woman's Auxiliary to the Southern Medical Association will be held in Dallas, Texas, November 5-8. Headquarters for the Auxiliary will be at the Baker Hotel.

BOOK REVIEWS

Differential Diagnosis of Internal Disease: By Julius Bauer, M. D., F. A. C. P., New York, Grune and Stratton, 1950. Illus. Pp. 866. Price, $12.00.

This book represents a departure from the usual. Instead of a rather complicated and cross-indexed collection of diseases, symptoms, and signs, Dr. Bauer has written an interesting, straight-forward, and highly personal account of problems involving diagnosis. The simplicity of the organization is indicated by the chapter headings, e.g. Chapter 1, Headache; Chapter 2, Chest Pain. Sub-headings are relatively few.

Also unusual in a book of this type is Dr. Bauer's recognition that a symptom may be of importance in itself, and should not always be considered just a clue indicative of some orthodox disease entity. Emphasizing this point of view, Chapter 6 is entitled "Disorders of General Feelings."

The practicing physician will recognize that the author has seen many patients, and that he is writing about things he observes day in and day out. The physician beginning practice will have available to him in this book the experience of an excellent clinician.

Apparent in many sections of the book are Dr. Bauer's unorthodox concepts, especially regarding the etiology of obesity, of various functional disturbances, and some of the degenerative diseases. Any one familiar with his *Constitution and Disease* will recognize the same dogmatic opinions, and probably will disagree with many of them.

This book will be of most value to the physician beginning practice, especially to the young internist or general practictioner. It should not be put in the hands of the student who will not distinguish the greater part which is very valuable from those sections which may be misleading.

PHILIP M. TILLER, JR., M. D.

Visual Anatomy: *Head and Neck*: By Sydney M. Friedman, M. D., Ph. D., Springfield, Ill., Charles C. Thomas, 1950, Pp. 217, figs. Price, $6.50.

In his preface Dr. Friedman states that the book is designed as a "revision text" for undergraduate and postgraduate students; it is intended for use in review, and not as a substitute for a textbook or atlas. As for the need of such a book, the author points to the curtailment of time devoted to anatomy in the present-day curriculum and to the inevitable forgetting of subject matter that together make review necessary. The choice of structures for inclusion, he explains, was determined by the aim "to suit the needs of medical practice in general."

The 88 illustrations are boldly executed, diagrammatic drawings in which the contents are reduced to essentials. They are the core of the book as a "visual text," where "facts are presented largely by illustration and only secondarily by the written word." The material is arranged by regions, and the approach in description is "outward from the basic framework."

HAROLD CUMMINS, *Ph. D.*

Sir William Osler: *Aphorisms from His Bedside Teachings and Writings*: Collected by Robert Bennett Bean, M. D. and ed. by William Bennett Bean, M. D., New York, Henry Schuman, Inc. 1950. Pp. 159. Price, $2.50.

Those who are familiar with a small volume called *Counsels and Ideals of Sir William Osler*, published in 1905 and now long out of print, will welcome this second collection of the wise aphorisms of Sir William Osler on medicine and the medical life. These cameos of wisdom are grouped by subjects such as The Medical Student, The Patient, etc. Dr. Robert Bennett Bean, at one time Professor of Gross Anatomy in the Tulane Medical School, gathered these notes during his association with Dr. Osler both as a student and as a graduate at Johns Hopkins University. Inclusion in this volume is more definitely medical than in *Counsels and Ideals*, as edited by Dr. C. N. B. Camac.

MARY LOUISE MARSHALL

PUBLICATIONS RECEIVED

Anson L. Brown, Inc., Columbus, Ohio: Technical Methods for the Technician, by Anson L. Brown, M. D. (4th Edit.).

Bruce Publishing Co., St. Paul: Allergy in Re-

lation to Pediatrics, by Bret Ratner, M. D.

Doubleday & Co., Inc., N. Y.: The Changing Years, by Madeline Gray.

Paul B. Hoeber, Inc., N. Y.: A Textbook of Clinical Neurology, by J. M. Nielsen, B. S., M. D. (3rd Edit.).

The C. V. Mosby Co., St. Louis: Human Biochemistry, by Israel S. Kleiner, Ph.D., (3rd Edit.)

Charles C. Thomas, Springfield, Ill.: Dr. Alexander Spitzer's The Architecture of Normal and Malformed Hearts, translated by Maurice Lev., M. D., and Aloysius Vass, M. D.; Causalgia, by Frank H. Mayfield, M. D.; Chronology of Ophthalmic Development, by Arthur H. Keeney, M. D.; Instruments and Apparatus in Orthopaedic Surgery, by E. J. Nangle, M. B.; Food and You, by Edmund Sigurd Nasset, A. B.

Year Book Publishers, Inc., Chicago: Handbook of Operative Surgery of the Stomach and Duodenum, by Claude E. Welch, M. D.